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Address.

ANTERIOR POLIOMYELITIS.*

By A. J. McLaughlin, M.D., Boston.

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CAUSE OF THE DISEASE.

Although much remains to be learned in regard to poliomyelitis, certain facts have been demonstrated beyond question. The disease is caused by the presence in the central nervous system of a minute microörganism which belongs to the group capable of passing through a Berkefeld filter. The organism or virus is cultivable *in vitro* on suitable media. The virus from human cases is pathogenic for apes, producing characteristic symptoms similar to those observed in human cases. The rabbit is susceptible though he is apt to prove refractory, and if symptoms are produced, they differ markedly from those observed in man. The guinea pig has been reported to be susceptible at times. No other animals are known to be susceptible.

SOURCE OF THE VIRUS.

The only known source of the virus is the human body, although the possibility of another reservoir in some animal must be conceded. In persons dead of poliomyelitis the virus has been found in the brain, spinal cord, mesenteric glands, tonsils, and secretions of the nasopharynx and intestines. In acute cases the virus has been found in the secretions of the nasopharynx and washings from the rectum. It has also been found present in the secretions of the nasopharynx and intestines in convalescents after several weeks or even months, and in the nasopharyngeal secretions of apparently healthy persons who had been exposed to infection. The virus has been recovered from dust in rooms occupied by patients with poliomyelitis.

The demonstrated sources of infection are, therefore:

Persons ill with poliomyelitis,
Convalescents,
Healthy carriers.

TRANSMISSION.

The manner in which the disease is transmitted from its reservoir in the human body is still in doubt, although its probable course may be surmised from the facts at hand. Many claims have been made and some experimental work has been done in an effort to establish the rôle played by biting insects in the transmission of the disease, or to show that a reservoir of infection in some lower animal would best explain its peculiar distribution and erratic spread. Its analogy to other diseases in certain epidemiologic features has suggested similar modes of insect transmission, and yet laboratory experiments have uniformly failed so far to confirm these theories. The epidemiologic observations, while appearing to support in some particulars, in other phases tend to make such a conclusion impossible.

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* Delivered at a joint meeting of the Boston District of the Massachusetts Homeopathic Society and the Suffolk District of the Massachusetts Medical Society, October 5, 1916.

Very often laboratory experiments do not represent natural conditions, but some of the possible modes of infection of monkeys, demonstrated by laboratory experiment, approach natural conditions and suggest the most feasible and probable portal of infection. Monkeys may be infected by rubbing the virus upon the nasal mucous membrane, and this suggests a possibility of easy infection through the nasopharynx under natural conditions.

Frost*, in his scholarly monograph, makes the following sane and logical deduction:

> "On the whole the experimental evidence, taken alone, while not excluding other means of transmission, points to the conclusion that poliomyelitis is a contagious disease, spread from person to person through interchange of infectious secretions, the sources of infection being the clinically definite and clinically indefinite acute cases of poliomyelitis, convalescents, and passive human carriers."

EPIDEMIOLOGY.

A brief review of its epidemiologic peculiarities will illustrate the contradictory and variable nature of its manifestations in the field.

GEOGRAPHIC DISTRIBUTION.

Poliomyelitis is of world-wide distribution. Its outbreaks have occurred in every climate from the equator to the North Temperate Zone. It is true, however, that it has been reported more constantly and in greater evidence in the northern than in the southern states of the Union.

SEASONAL PREVALENCE.

The seasonal prevalence of poliomyelitis is more characteristic than any of its other epidemiologic manifestations, with the exception of its age incidence. It reaches its maximum in August and September, although cases are reported in every month of the year in Massachusetts. Its seasonal prevalence resembles that of diarrhea and enteritis of children, and typhoid fever. The presence of the virus in the intestinal contents strengthens the analogy. Its seasonal prevalence also corresponds to the period of greatest activity of mosquitoes and flies, and, therefore, is consistent with the theory that biting insects are a factor in its causation. Some observations have seemed to show a relation between dust and dry seasons and the outbreaks of poliomyelitis. On the other hand, it has been prevalent in wet seasons and in wet climates.

It must be remembered that this disease is not confined to summer or early autumn. We not only have it every month in the year, but its endemic prevalence is probably much greater than reports show. Race, nationality and sex show no marked or characteristic influence. Social and economic factors seem to play a small part in its transmission. Cases are reported from the homes of the rich, the well-to-do, and the poor. The sanitary conditions surrounding the home do not seem to be a determining factor.

PECULIAR MANNER OF SPREAD.

Most diseases spread in a regular progression along the lines of travel. This applies even to those diseases which are transmitted by insects. This is not always so with poliomyelitis. It may be epidemic in Washington, evade Baltimore, and attack Philadelphia; or, as Frost pointed out, the epidemics of 1908, 1909, and 1910, in Minnesota, Iowa and Nebraska, were commonly regarded as sequelae of the New York epidemic. Chicago, however, through which practically all travel to these states from New York passed, escaped.

On the other hand, there are instances of rapid spread over a wide area, apparently on radial lines from a central focus, as the Iowa epidemic of 1910, and the Swedish outbreak in 1905, described by Wickman. We have instances of rapid radial spread which suggest man as the carrier, but there are also the instances difficult to explain, of exemption of cities most exposed to infection through travel, as Baltimore, in 1910.

This same peculiarity of sparing an intervening city between two badly infected cities is noted in the spread of cerebrospinal meningitis. The peculiar distribution of poliomyelitis and small total incidence in the population find an analogy in some plague epidemics, but its age incidence is totally at variance with that of plague.

SMALL NUMBER OF PERSONS ATTACKED.

Less than 1/10 of 1% often represents the attack rate in an outbreak, or less than one person per thousand of the population. This peculiarity has not been explained, although two logical explanations have been suggested,—either that the amount of susceptible material is limited by some immunizing influence, or that its transmission is devious and selective, involving possibly an animal reservoir and an insect transmitter.

URBAN AND RURAL PREVALENCE.

The prevalence of the disease seems to be greater in rural and suburban districts than in cities. It must be conceded that most of these observations have been made in epidemics rather than in times of endemic or low prevalence.

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* Frost, Wade H.: Poliomyelitis Reprint No. 350, Public Health Reports, Washington, 1916.

AGE INCIDENCE.

The most consistent epidemiologic characteristic of poliomyelitis is the age incidence. In a mass of contradictory and irregular manifestations only the seasonal prevalence and age incidence are consistent. The great majority of the cases are children under five, a smaller group from five to ten, a few from ten to twenty, and only rarely over twenty.

Assuming that poliomyelitis is a communicable disease, transmitted from person to person, if the rural prevalence is higher in epidemics than the urban, it follows that there must be relatively more susceptible material in the rural districts. It is reasonable to suppose that some immunizing influence, operating more constantly and more actively in the city, cuts down the amount of susceptible material. What is the nature of this influence? Is it due to an increased resistance coming on with age, or is it due to an active immunity acquired by having had the disease in a light or abortive form? It has been demonstrated that convalescents and healthy carriers harbor the virus in the nasopharyngeal secretions for weeks and months. It has also been shown that in apes the nasopharynx, with its close relation, through the lymphatics, with the central nervous system, is an easy portal of entry, and monkeys inoculated intracerebrally have shown that the nasopharynx is also a point of egress for the germs. We have here all the conditions for the widespread distribution of the virus.

In all recent epidemics light and abortive cases have been shown to be numerous. It is not unlikely that these light cases, which ordinarily pass unrecognized, without paralysis, or paralysis of the most fleeting character, constitute a larger part of the total morbidity than the frank paralyzed cases. In considering the possibility of an active immunizing influence, we must concede also the possibility of variations in virulence, not alone as among individuals attacked, but variations in virulence of the outbreaks themselves. Variations in virulence exist in practically all microörganisms, and the virus of poliomyelitis is no exception. The difference noted in individual cases in the severity of the attack may be due to a complex set of conditions, involving not only the infecting agent, but also the susceptibility or self-protective power of the individual. Differences in type of an entire epidemic, however, while their cause may be complex, also undoubtedly occur. The fatality rate of epidemics of other diseases varies greatly, it often being lower in centers where the disease has been active over the longest period. Smallpox varies from a mortality of 15 to 30%, to the mild form, practically without deaths, which in the South was called "Cuban itch." Immunity is conferred by Cuban itch, as well as by a severe case of smallpox. It is not improbable that an active immunizing influence is going on constantly, constituting an endemic prevalence of this disease, with relatively few paralyzed cases.

This hypothesis would best explain the age-incidence of the disease, for with a widespread infection, opportunity for immunity is afforded in the first years of life. Theoretically, such a process of immunization would be most active where opportunities for contact were greater, viz: the city. We should have a higher percentage of immunes in the city, and a lesser percentage of susceptible individuals. If this reasoning were sound, we should not only have a lesser number of immune people in the country, but the susceptible group should have a higher age-limit. Is this the case?

The difficulty of separating rural from urban districts is recognized. Statistics are not available at present in Massachusetts in sufficient amount or of a proper character to warrant positive conclusions. I made an effort to determine whether the age limit of those attacked was the same in rural and urban outbreaks. A group of about 20,000 persons in 15 towns where poliomyelitis has occurred, ranging in population from 427 to 2213, was taken and compared with the worst stricken of our smaller cities, North Adams. The population of the rural group is 23,361; that of North Adams, 22,039. The attack rate was very nearly the same, as there were 19 cases in the rural group and 21 in North Adams.

	Population	Total Cases	Under 5	5-10	10-15	15-20	Over 20
Rural Group	23,361	19	7	5	3	1	3
North Adams	22,039	21	16	5	0	0	0

In round numbers the percentage may be expressed:

PERCENTAGE OF TOTAL CASES.

Rural	Under 5	5-10	Over 10
Rural Group	37	26	7
North Adams	76	24	0

This difference is striking, and although based on a comparatively small group, is suggestive that the age limit of susceptible age groups may be higher in rural and suburban life. The relation between the percentage of susceptible persons and the age limits of the susceptible group should be studied further. It is reasonable to suppose that, if the opportunities for immunity are less, one would expect a larger proportion of susceptible persons and a higher age limit in the group. For example, measles is ordinarily limited to the lower age groups, but if introduced into virgin soil it attacks all ages, and the immunity of adults in our cities is probably due to infection during the earlier years of life. It would be interesting to determine, in a large group of thousands of cases of measles, scarlet fever and poliomyelitis, not only what the real relation between rural and urban prevalence is, but also what percentage of the total is found in the various age groups in city and country.

We have had our share of dreams and theories in this disease. Its analogy in one given particular to another disease has been sufficient to create a theory showing its transmission to be due to the same agencies. As a filterable virus, it suggests yellow fever, and its seasonal prevalence corresponds with the period of greatest activity of the mosquito. It also commonly declines with the advent of cool weather. But yellow fever stops with the first frost, and can start again only when new material is introduced from without, and in the presence of mosquitoes. Poliomyelitis declines in prevalence in the autumn, but continues at a lower rate throughout the winter months, so that the mosquito, even if shown to be a factor in increasing the prevalence in July, August or September, must be exonerated from blame in transmitting the disease through the winter months.

Poliomyelitis bears a certain analogy to rabies. Its predilection for nerve tissue, and what at times at least seems like a protracted incubation, suggest rabies, but evidence is lacking to show that the resemblance goes any further.

Its resemblance to plague in its spread and distribution of cases, lack of secondary cases, etc., has been noted, and the rat and flea combined would explain many of the peculiar epidemiological manifestations of this disease. It is difficult, however, to reconcile its peculiar and consistent age incidence with a flea-borne disease, in which you would expect persons of all ages to be bitten.

This review of the epidemiologic features of poliomyelitis and the known facts in its etiology accentuates the baffling nature of the problem, from the point of view of the health officer. With cholera, plague, yellow fever, he has precise knowledge and can act accordingly, with the expectation of definite results. In poliomyelitis there is no certainty of the details of transmission, no simple diagnostic procedure, no feasible method of determining carriers or the presence or absence of immunity. What we need now is not more theory but more research work, both in the laboratory and in the field, to eliminate or confirm the various theories.

It is well to remember in our research work that a positive result under artificial conditions may be given too much weight in its application to natural conditions. On the other hand, a negative result should not be considered conclusive. Many eminent workers failed to transmit measles to monkeys and others succeeded, because former negative results did not deter them. Often, too, laboratory workers expect the same symptoms in one animal as are presented in man or in the ape.

It is imperative that we be able to find the abortive light cases and carriers. As practical health officers we need a diagnostic procedure that is reasonably specific and comparatively easy in technic to determine the presence of the disease. This is needed, not only in the interest of the patient, but early diagnosis is essential for the protection of the community in detecting carriers and light cases. We also need a diagnostic procedure reasonably easy of application which will determine the presence or absence of immunity, such as the Schick test does for diphtheria.

There are other needs and possibilities which suggest themselves, a prophylactic for active immunization, and a serum treatment of the disease itself. Two misleading tendencies are apparent, one—general—to look for the facts of this disease in epidemic times only, overlooking its probable endemic prevalence; two—individual—to expect paralysis in every case. To correct these tendencies we need a careful study of diseases of children, including especially diarrhea and enteritis in children under two years of age, regardless of the presence of an epidemic, and we need, not alone the means of accurate diagnosis, but a general willingness to accept this diagnosis in the cases in which paralysis is not apparent.

In the face of our incomplete knowledge, this is no time for dogmatic utterance. We must not eliminate theories or hypotheses, however fantastic, upon mere opinion. We need facts and methods, and careful research work is the only way in which these essential facts and methods of diagnosis can be secured.

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Original Articles.

THE OCCURRENCE AND DIAGNOSIS OF PERICARDITIS.*

By Edwin A. Locke, M.D., Boston.

The infrequency with which pericarditis is seen clinically, in comparison with the relative frequency of its recognition at the autopsy table, is a striking and singularly significant fact and has led to the statement by one prominent medical writer that the diagnosis of pericarditis is usually a post-mortem one. Although regarded as one of the rarer of the cardiac affections it is without doubt far more common than supposed and by reason of its high mortality should rank next to endocarditis in importance among the cardiac diseases.

Several evident facts can be stated to explain, at least in part, the failure to diagnose such a large proportion of the cases of pericarditis:—

1. The changes in the pericardium, except in the case of direct trauma, nearly always occur as a complication during the course of some other disease. Indeed, it is doubtful if pericarditis is ever primary except in the case of injury or possibly in rare instances of in-

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* Read at the meeting of the Boston Medical Library in conjunction with the Suffolk District Medical Society, Feb. 16, 1916.

fection of the sac by the tubercle bacillus. The cause of the symptoms manifested being known, it is but natural that a complication which too often presents no obvious symptoms or signs should be overlooked.

2. Pericarditis in a majority of cases occurs as a late complication, often terminal, when examination of the heart is most difficult and unsatisfactory and the presence of predominant signs in the chest obscures those due to the involvement of the pericardium. Not infrequently the patient is too sick to be examined thoroughly.

3. Certain types of pericarditis frequently give no characteristic signs or symptoms, those present being reasonably accounted for by the primary disease. In other words, many of the symptoms and signs of pericarditis are common to other intrathoracic diseases, especially those of the heart.

4. Signs, when present, are largely subjective.

5. Perhaps most important of all, the possibility of pericardial involvement is usually, I believe, forgotten and any suggestive symptoms and signs in consequence attributed to the already known condition.

AUTOPSY STUDIES.

In an effort to determine as exactly as possible the incidence of this disease among hospital cases, and the possibility of more frequent diagnosis, I have made a careful study of the autopsy reports at the Boston City Hospital for the past nineteen years together with the clinical records of the same cases. I shall confine myself in this brief paper to a discussion of these results and to a consideration of some of the more essential points in diagnosis, in an effort to emphasize the importance of the disease clinically.

The total number of post-mortem sections made during the nineteen years (*i. e.* from 1897 to 1915 inclusive) was 3,683. In this series acute lesions of the pericardium were described in 150, and chronic lesions in 209 instances. Exclusive of these 359 cases of true pericarditis, 88 showed milk patches in the pericardium.

The above figures show that acute pericarditis was found in 4% of all autopsies.

In a rather careful search through the literature on pericarditis I have been able to find but few statistics of this nature. Wells[1] gives quite similar figures. Among 1,048 autopsies on adults he found evidence of acute inflammation of the pericardium in 57, or 4.5%, and chronic inflammation in 71, or 6.8%, a total of 128 cases, or 11.3%. In 220 necropsies at the Boston Consumptives' Hospital on individuals dying of tuberculosis 16, or 7.3%, showed pathologic processes in the pericardium. These rather astonishing figures indicate that pericardial complications must be relatively common clinically and especially since a large percentage of cases with pericarditis do not succumb.

A comparison of the above figures with similar ones for acute endocarditis emphasized still further the clinical importance of pericarditis. In the above mentioned 3,683 autopsies, acute endocarditis was described in 185, or 5%, and chronic endocarditis in 462, or 12.6%, making a total of 647 cases of acute and chronic endocarditis, or 17.6%. If this series of 3,683 be accepted as representative, which seems reasonable, we may say that the relative frequency of acute pericarditis and endocarditis as found at autopsy is in the ratio of 4:5 and in the case of the chronic lesions of 5.7: 12.6, or, if the acute and chronic cases are combined, of 9.7:17.6.

With the purpose of gaining some definite idea of the possibility of accuracy in the diagnosis of pericarditis I have examined all the clinical records of the 150 cases of the acute form. In only 27 instances, or 17%, is there any clear evidence in the clinical notes of the presence of disease of the pericardium. In the majority of cases the data are very meagre and exact inference as to the type and extent of the lesions is consequently impossible. A detailed study of the particular types of pericarditis found reveals an even greater deficiency in the clinical work. The most glaring errors are in the cases of pericarditis with effusion of various forms. There was a total of 17 cases, with an effusion of 200 c.c. or more, the amount varying from this minimum to a maximum of 1,000 c.c. In not a single instance does the history contain any positive diagnosis of the effusion and in only 3 is the description even moderately suggestive of fluid. The 3 cases with the largest effusion, *i. e.* 500, 750 and 1,000 c.c., were unsuspected if one may judge by the records. A rub was mentioned in only 2 instances among 42 cases of fibrinous pericarditis.

One must admit that these statements are somewhat unfair to the clinician as no allowance is made for incomplete clinical notes, yet after generous allowance is made it must be admitted that the record is an astonishing one. In at least 50% of cases, I believe, it should be possible to diagnose the condition with reasonable certainty.

Greater accuracy in diagnosis means first of all a general knowledge of the relative frequency of the various types of pericarditis and of the diseased conditions with which pericarditis is commonly associated. In the following table are given the 359 acute and chronic cases of pericarditis above mentioned, grouped according to the type of lesions found.*

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* Any classification of the pathologic conditions in the pericardium is, to a large degree, artificial and arbitrary. In the above table no account has been taken of simple hydropericardium or milk spots. Under the term "purulent pericarditis" are included only those cases where actual pus was found in the sac or pyogenic organisms were present in the exudate. Nearly all had purulent fluid in excess of 20 c.c. Only pure haemorrhagic exudates are included under the term haemorrhagic pericarditis. A considerable number grouped as serofibrinous or purulent showed blood-tinged fluid, however.

TABLE I.

Types Pericarditis	Acute No. Cases	Acute Percentage	Chronic No. Cases	Chronic Percentage
Fibrinous	42	28.00	17	8.13
Serofibrinous	33	22.00	82	39.24
Haemorrhagic	4	2.67	5	2.39
Purulent	39	26.00	3	1.44
Tuberculous	0	0.00	5	2.39
Adhesive—partial	14	9.33	39	18.66
Adhesive—total	18	12.00	57	27.27
Calcified	0	0.00	1	.48
TOTALS	150	100	209	100

It will be noted that in the group of acute cases the largest number are of the so-called fibrinous type although the fibrinous, serofibrinous, purulent and adhesive forms are found with about equal frequency, the limits being 21.33 and 28%. The serofibrinous, purulent and haemorrhagic, which we recognize clinically as pericarditis with effusion, together represent 50.7% of the total acute cases.

Among the chronic types the serofibrinous and adherent forms distinctly predominate. This last mentioned group comprises approximately 46% of the total.

These figures show a close correspondence with those of Breitung[2] (Table II) who found 324 instances of acute and chronic pericarditis among the post-mortem cases at the Berliner Charitè during a period of eleven years.

TABLE II.

Types	No. Cases	Percentage
Pericarditis serofibrinosa	108	33.33
Pericarditis haemorrhagica	30	9.26
Pericarditis purulenta	24	7.41
Pericarditis tuberculosa deuteropathica	24	7.41
Pericarditis tuberculosa idiopathica	2	.62
Pericarditis adhaesiva partialis	111	34.26
Pericarditis adhaesiva totalis	23	7.09
Pericarditis ossificans	2	.62
SUMMA	324	100

It seems probable that among the cases seen clinically in a general hospital the fibrinous type predominates to a far greater degree than would appear from pathologic statistics. As a rule they are the mildest and occur with the less seriously ill patients with whom recovery is unquestionably much more common.

In the fatal cases of pericarditis with effusion, at least, the serous and the purulent forms of the acute type seem to play approximately equal parts, as indicated in Table I, while in the chronic cases serous fluid is almost invariably the type of fluid present. True haemopericardium is rare in both the acute and chronic cases although blood-tinged exudate is by no means uncommon. Including the 4 cases of true haemorrhagic pericarditis, blood-tinged fluid was found in 17 instances, or 11%, and in association with the following primary diseases: nephritis 3, septicaemia 2, empyema 2, aortic aneurysm 1, rheumatism 1, pneumonia 1, tuberculosis 1, and unclassified 6. Among the chronic cases, and including the five cases of true haemorrhagic pericarditis, the fluid was of this form in only nine, or 4%. Pericarditis with effusion in the aged is said to be commonly haemorrhagic. (Osler.) This does not hold true in the cases tabulated above.

THE PRIMARY DISEASE IN PERICARDITIS.

The question of the nature of the primary disease in pericarditis is naturally of first importance to the clinician as especially indicating the conditions under which pericarditis most frequently arises. Wells[3] gives the possible channels of infection to the pericardium as follows:—1. the blood stream; 2. the lymph vessels; 3. direct infection by trauma; 4. by extension which must be from, *a.* heart or blood vessels within the pericardium; *b.* mediastinum; *c.* pleura; *d.* peritoneum. With these various possible modes of invasion it is obvious that pericarditis may arise in the course of a very large number of diseases. Any attempt at classification of these primary diseases is unsatisfactory but in the interest of conciseness I shall offer the following grouping:

1. *Trauma and perforation of the pericardium.*
2. *Infectious diseases* (e. g. rheumatism, chorea, pneumonia, tuberculosis, meningitis, scarlet fever, influenza, smallpox, typhoid, syphilis, gonorrhoea, actinomycosis.)
3. *Local or general septic processes* (e. g. septicaemia, pyaemia, osteomyelitis, tonsillitis, erysipelas, local abscesses.)
4. *Chronic diseases, usually as a terminal complication* (e. g. nephritis, advanced tuberculosis, carcinoma.)
5. *Chronic intoxications and poisonings* (e.g. gout, diabetes, phosphorus poisoning.)
6. *Extension or irritation by contiguity from neighboring structures* (e. g. diseases of mediastinum, pleura, lungs etc.)
7. *Affections of the heart and aorta* (e. g. endocarditis, affections of the myocardium, aortic aneurysm.)
8. *Blood diseases and haemorrhagic diatheses* (e.g. severe anaemia, leucaemia, haemophilia, purpura, scurvy.)

The majority of all cases of pericarditis are found associated with only a few of the conditions mentioned above. Taking into consideration all ages rheumatism is unquestionably the commonest cause. The infrequent finding of this condition at autopsy secondary to rheumatic fever is easily explained by the fact that this disease seldom runs an acutely fatal course, death, if occurring, being due to complications of long standing. In the 150 cases of acute pericarditis studied at the Boston City Hospital, rheumatism was evident as the primary disease only twice. Autopsy statistics of chronic pericarditis show a considerable percentage to be due to this disease. On the other hand the incidence of pericarditis in acute rheumatism, as given by different authors, varies within rather wide limits (Latham 13%, Peacock 16%, Sibson 19%, Pye Smith 22%, Whipham 17%, Osler 6%).[4] The total number of cases of acute rheumatism included by these authors is 2,080 and the occurrence of pericarditis 344, or 16%. Eichorst places his estimate as low as 3% and von Schrötter as high as 30%[5]. Houchard[6] quotes the statistics of many authors on this point which vary from a minimum of 10 to a maximum of 75%. All authorities are agreed that acute rheumatism as an etiologic factor is largely confined to youth and early adult life.

Pericarditis occurs with such a considerable variety of other diseases that it is difficult to give any precise statement of their order of frequency. In adults pneumonia and pleurisy probably come next to rheumatism in importance. With the former disease the type of pericarditis is often frankly purulent although in some instances the pneumococcus may be recovered from the exudate in the absence of pus. These cases even when purulent are, furthermore, not always fatal. The development of pericarditis with pneumonia is quite directly dependent on the severity and extent of the process in the lungs, being most common in those cases with bilateral involvement and more frequent with consolidation of the lower than of the upper lobes.

Septic processes, especially septicaemia or pyaemia, and those of the pelvic organs or bones, quite commonly lead to pericardial complications and are particularly prominent in the fatal cases. The pathologic type of changes in the pericardium is variable but the exudate is commonly purulent although a rather large percentage of the cases of adherent pericardium are of this origin.

Pericarditis is generally acknowledged to occur with nephritis, but it is difficult in many instances to establish a definite relationship between the two. Some authors consider nephritis to be a very common cause of the condition, while others regard it as rare and due not to the disease in the kidneys, but to some associated pyogenic process. It is especially observed with the chronic nephropathies. Any type of pericarditis may occur and if an effusion is present, it is sometimes haemorrhagic.

A less common cause of pericarditis is tuberculosis of the thoracic organs or acute miliary tuberculosis. The changes in the pericardium may be identical with those found in association with other diseases or be strictly tuberculous.

TABLE III.

TABLE OF 150 AUTOPSY CASES OF ACUTE PERICARDITIS ARRANGED TO SHOW THE NUMBER OF THE DIFFERENT TYPES OCCURRING WITH VARIOUS DISEASES

	NUMBER OF CASES OF EACH TYPE OF PERICARDITIS						
PRIMARY DISEASE	FIBRINOUS	SEROFIBRINOUS	PURULENT	ADHESIVE (TOTAL)	ADHESIVE (PARTIAL)	HAEMORRHAGIC	TOTALS
Pneumonia	20	13	20	5	5	..	63
Empyema	..	1	5	..	..	..	6
Abscess Lung	1	..	..	..	..	..	1
Aortic Aneurysm	..	2	1	..	1	1	5
Acute Endocarditis	..	..	..	..	..	1	1
Tuberculosis	1	2	2	..	1	1	7
Local or General Sepsis	10	6	9	1	1	1	28
Nephritis	4	4	2	3	3	..	16
Meningitis	1	..	2	..	..	..	3
Rheumatism	..	..	1	..	1	..	2
Cirrhosis Liver	..	1	..	..	..	..	1
Not Determined	4	5	1	4	2	1	17
TOTALS	43	33	42	14	14	4	150

In how large a percentage of these the involvement was terminal and thus due to secondary infection it is impossible to say, but from a careful reading of the clinical histories and study of the autopsy reports, it is evident that the percentage is a rather large one. Pneumonia, empyema and abscess of the lung together comprise 47%.

It is difficult to state exactly the relation of age to the incidence and type of pericarditis. Statistics show that the disease is much more common in childhood than in adult life. In infancy, broncho-pneumonia and empyema play the most important rôle as etiologic factors. Throughout childhood rheumatism remains at the head of the list. During early adult life, the most frequent causes are rheumatism, pneumonia, tuberculosis and bone diseases. After thirty, rheumatism is relatively rare while pneumonia becomes an increasingly important cause. In old age, pneumonia and chronic nephritis are the most frequent (Blechmann). At all ages septic processes figure prominently in the etiology.

TABLE IV.

TABLE OF 150 AUTOPSY CASES OF ACUTE PERICARDITIS ARRANGED BY AGE PERIODS ACCORDING TO PRIMARY DISEASE.

	AGES							
PRIMARY DISEASE	UNDER 10 YRS.	10-19 YRS.	20-29 YRS.	30-39 YRS.	40-49 YRS.	OVER 50	NO AGE GIVEN	TOTALS
Pneumonia	5	4	8	14	10	21	1	63
Empyema	1	..	2	1	2	..	..	6
Abscess Lung	..	..	..	..	..	..	1	1
Aortic Aneurysm	..	..	..	1	2	2	..	5
Acute Endocarditis	..	..	..	1	..	..	..	1
Tuberculosis	2	..	..	2	1	2	..	7
Local or General Sepsis	6	3	3	4	5	6	1	28
Nephritis	..	..	3	5	2	6	..	16
Meningitis	..	..	2	1	..	..	..	3
Rheumatism	..	..	1	..	1	..	..	2
Cirrhosis Liver	..	..	..	..	1	..	..	1
Not Determined	3	1	..	3	5	5	..	17
TOTALS	17	8	19	32	29	42	3	150

SYMPTOMS AND SIGNS OF PERICARDITIS.

I shall discuss briefly only the more important of the symptoms and signs of pericarditis. The symptoms of this condition are seldom characteristic and it is, perhaps, the rule that an unsuspected pericardial involvement is found on careful routine examination or because sought for in those diseases with which it is known to be frequently associated. At other times the possibility of trouble in the pericardium is suggested by the sudden increase in the severity of the symptoms during the course of a critical illness. In spite of the most careful observation, however, definite evidences of the disease may be entirely absent throughout its course. West[7] has particularly called attention to these last mentioned cases which he speaks of as the "latent type." Chronic pericarditis, and especially the adhesive form, is often found post-mortem without any suggestion of the condition having been present during life. He further speaks of certain acute cases where the process is confined to the posterior portion of the pericardium and therefore friction sounds never become audible or only many days after the appearance of symptoms which make the diagnosis probable. West considers that latent cases are very commonly due to gout or chronic nephritis.

The clinical picture is difficult to give. It depends on many factors, but chiefly, the nature of the process, whether acute or chronic, the character and amount of the exudate, the condition of the heart muscle and endocardium and the presence or absence of complications (Sinnhuber).

In not a few, the onset is more or less well marked. The patient becomes restless, breathes with a shallow, rapid respiration, looks distressed and anxious, the face has a dusky pallor, and he often complains of pain or oppression in the region of the precordia. Nausea and vomiting, which are rather common late symptoms in the fatal cases, are occasionally met with at onset. Bramwell, in speaking of the onset of pericarditis says, "the experienced eye can often detect that something has occurred, that the patient is not so well as he was at the previous visit"; and this, I think, expresses very well the vague clinical picture which is often presented. An initial chill is rare. Pain so often met with as an initial symptom, varies from a vague sensation of pressure or distress in the region of the precordia, to the most intense and agonizing stabbing character. Sibson[8] observed pain in 70% of his cases. It is said to be most common in pericarditis with effusion although in this same type pain may be entirely absent from first to last. If pain appears early it invariably disappears with the development of an effusion. Epigastric pain may be present with large effusions (Sibson). Especially in children pressure over the precordia or deep inspiration frequently increases the pain, rarely also the skin may be extremely hyperaesthetic. Pressure in the epigastrium just below the xiphoid cartilage or at the costal angles often induces a severe pain reaction. The temperature is apt to show a more or less definite rise with the beginning of inflammation in the pericardium but is in no way characteristic.

The pulse and respiration are much more disturbed as a rule ("Perverted pulse-respiration ratio," West).[9] Sometimes the respiration reaches 60 or 70 per minute and is excessively labored and shallow. Shortness of breath is common and with large effusion often becomes extreme orthopnoea. Cases of paroxysmal dyspnoea have been described.

With marked effusion the patient often assumes a sitting posture and sometimes will be found with the legs and thighs strongly flexed and resting with the arms on the knees. Hertz[10] describes this as an important sign of pericarditis with effusion and terms it the "knee-chest sign." Wynter[11] lays particular stress on the absence of abdominal respiration as a sign of pericarditis. He states that the diminution in respiratory movements in case of diseases of the lungs and pleura is usually not marked and is one-sided, but in pericarditis it is bilateral and often entirely absent. This author considers it frequently to be as marked as in abdominal diseases but always rigidity and general tenderness are for the most part lacking. This diaphragmatic paresis he explains on the grounds of reflex inhibition due to involvement of the diaphragm secondary to inflammation in the pericardium. His observations lead him to consider it one of the earliest and most reliable of the symptoms of pericarditis and quite as common with the fibrous as with the serofibrinous form. It affords a reasonable explanation of the upright position so frequently taken by the sufferer.

Cough of a short, irritative, spasmodic character may be present as in pleuritis.

The initial excitement and restlessness may give place to a more or less marked condition of drowsiness after pericarditis is well established. Delirium, even of a most intense nature, is occasionally seen, and rarely coma.

Later symptoms of pericarditis depend largely on two general factors: first, the degree of cardiac embarrassment, and second, pressure from the distended pericardial sac. The first condition is chiefly caused by paralysis of the diaphragm and direct influence on the heart muscle in consequence of the local inflammation. The pericardial sac is firm and inelastic but, when inflamed, is easily stretched, and consequently an enormous effusion may cause very few cardiac symptoms (MacKenzie). Cardiac disturbances, such as extra systole and auricular fibrillation, are probably due not to the pericarditis but to a preëxisting diseased myocardium (Cowan).

The symptoms from pressure from the distended sac are among the latest and most severe. Through pressure on the lungs, the breathing is especially embarrassed, leading to the intense dyspnoea or orthopnoea, cough, etc., mentioned earlier. Venous engorgement, especially of the veins of the neck, may reach an extreme degree, while cyanosis may be more intense than is seen in almost any other condition. Oedema is rare. Pressure on the left recurrent laryngeal, as in aneurysm and mediastinal growths, probably explains hoarseness and aphonia. Hiccough is occasionally seen and is probably the result of pressure on the phrenic nerves at the point where they pass down over the pericardium. Difficulty in deglutition is at times observed and swallowing may be impossible except in the sitting posture.

PHYSICAL SIGNS.

The physical signs of pericarditis are hardly more numerous than the symptoms but in general are much more characteristic and important. To a greater degree it is true that the signs vary considerably with the type of lesions and degree of involvement present.

In the early stages the first and most important sign is the friction fremitus or rub. The type of friction and its intensity depend on the nature of the exudate and force of the heart's contraction, and is variously described as "rubbing," "rustling," "whiffing," "harsh," "rough," "grating," "creaking," "scratching," etc. In its general quality it may resemble closely the pleural rub. As a rule the friction murmur is double, the "to and fro" sound, though fairly commonly it occurs as a single sound or very rarely triple, the "cantering horse" type. Occasionally it is practically continuous and so prominent as to obscure the heart sounds completely. In time the sounds, although often described as synchronous with those of the heart, are not quite so, hence the terms "mesosystolic" and "mesodiastolic" employed by some authors. Sibson emphasizes the fact that the pericardial sounds never begin or end with a shock and are characterized by the same intensity throughout. They may be intensified, however, by any increase in force of the heart's contraction, by sitting forward when upright or rarely by taking the recumbent position. They appear superficial and pressure of the stethoscope may occasionally augment the intensity.

In contrast to endocardial sounds they have no definite area where they are best heard nor paths of conduction. The commonest areas where they are heard are at the base and over the middle portion of the heart. It is usually stated that these sounds are never audible beyond the area of cardiac dulness or in the back, but a sufficient number of cases are reported to make it seem probable that in a not insignificant percentage the rub is heard over a relatively wide area of the thorax and in the lower left back also. Pauly,[12] Devie, E. et Gardère, C.,[13] Paviot, J. et Delactanal, J.,[14] and others have discussed this subject at length. In cases where the rub is heard beyond the heart limits, propagation is chiefly by the hypertrophied heart which is held close to the chest wall, but also to a varying extent by the thorax wall, indurated lung or possibly to some extent by the liver. The fact that friction is seldom audible in the back is not due to the fact that the posterior part of the pericardium is not involved, but because the sounds are successfully muffled by the interposed lower lobe of the left lung. When they do appear in this region the explanation is probably to be found in the fact that the greatly enlarged heart or the presence of a pericardial effusion either push the lung aside, or more probably render the lower lobe atelectatic in either case, the conditions being more favorable for the transmission of the sound. The murmur thus heard in the back is not transmitted from the anterior surface but produced in the posterior part of the pericardium. An especially important consideration is the fact that the rub may be present for only a very brief period, and thus escape observation.

A tactile thrill over the pericardium of a harsh, vibratory character, is a familiar sign (Sibson, 20%). It is felt over the same area as the audible friction. As in the case of the friction sounds it is apt to be transitory and change from day to day.

With the development of effusion of any form other more or less characteristic signs may appear. In youth, where the chest is still pliable, bulging over the region of the precordium is sometimes seen, likewise with large effusion the epigastrium may appear full and immobile.

With the accumulation of fluid, the palpable impulse ordinarily weakens, is more diffuse and moves upwards, at times reaching the third space. Coincidently the heart sounds become weaker and muffled. West[15] believes that one of the first results of pericarditis is involvement of the adjacent muscular tissue of the heart and consequently dilatation of this organ which is a factor in the alteration in the cardiac sounds. The friction sounds may or may not disappear as the fluid increases.

The amount of effusion necessary to be recognizable is a matter of some difference of opinion. Probably at least 150 to 200 c.c. must be present to give definite percussion signs (Sinnhuber).

The shape of the distended pericardium as mapped out by light percussion, is usually described as pyriform or pear shape. The upper limits are much raised, often reaching the second and, even in extreme cases, the first rib. From this point above, the left border passes rather sharply downward and then curves outward and downward forming a depression or slight indentation at the level of the third rib, this concavity being commonly known as "Sibson's notch" or the "cardio-mediastinal notch." This is especially important as contrasting with convexity at this point of the left border of dulness in the case of cardiac dilatation. In extreme instances this left border at the level of the fifth or sixth space may reach the outer limits of the axilla.

The right border passes downward less diagonally than the left to meet the line of liver dulness at an obtuse angle. Attention was directed to the dulness in the fifth interspace to the right of the sternal edge by Rotch,[16] who considered it one of the earliest signs of pericarditis with effusion.

The lateral limits of dulness vary slightly with change in position. Similarly, the impulse may not be felt in the prone position, but palpable when the patient sits up and forward.

Pressure signs of the effusion are of considerable moment. Ewart[17] described a "first rib sign," *i. e.*, under these conditions the upper edge of the first rib can often be felt, due to the fact that the clavicle is raised, thus relaxing the ligament between the two bones. The liver and diaphragm may be considerably pushed downward. Calvert,[18] under the title "A New Sign Differential between Dilatation of the Heart and Pericarditis," published the result of his work which he believes shows that in pericarditis with effusion, the right lobe of the liver is low, varying in position from the fifth interspace to the sixth rib, while in dilatation of the heart, the lobe of the liver is high, in position from the fourth to the fifth rib.

The most striking signs of pressure are those due to compression of the lungs. Bamberger[19] first described a small quadrilateral patch of dulness low down in the intrascapular space on the left. Many authors have since called attention to the altered physical signs in this region. In my experience changes are nearly uniformly found near the inferior angle of the scapula on the left in cases of massive effusion in the pericardium. The most constant sign is dulness of varying degree, usually marked, sometimes accompanied by diminished fremitus and respiration and at others by a more or less intense bronchial type with increased voice sounds. Rarely bronchophony or egophony is present. In a few instances I have been able to demonstrate a considerable lessening of the above signs when the patient leaned forward in a sitting position. These signs just described are sometimes so striking as to lead to a diagnosis of pneumonia.

CHRONIC ADHESIVE PERICARDITIS.

This sequel of acute inflammation of the pericardium is by no means rare but so frequently escapes detection that it is not given deserved prominence among the forms of pericarditis. Pitt[20] states that among 10,000 post-mortem examinations at Guy's Hospital he found 400 cases of acute pericarditis and about the same number of the adherent form of which one-sixth showed universal adhesions. Smith[21] found among 3,053 autopsies at the Massachusetts General Hospital (1897-1913) complete or partial obliteration of the pericardium in 62. In my own series of 3,683 autopsies partial or complete obliteration of the pericardium sac was found in 32 instances among the acute cases, or 21%, and in 96 of the chronic cases, or 46%.

The picture of adherent pericarditis is quite as varied as the degree and nature of the anatomic changes, and with few exceptions is an indefinite one. It may present a considerable variety of phenomena or none, according to the degree of disturbance of the circulation and respiration.

Laennec[22] records his observation that "adhesion of the heart to the pericardium frequently does not interfere with the exercise of its function." The accuracy of his conclusions has been established by many clinicians since Laennec's time. If the adhesions be confined to the heart and its enveloping sac, even though the fusion between the serous surfaces is complete, the embarrassment to this organ is trifling and does not lead to hypertrophy or dilatation. It is only when the pericardium becomes glued to adjacent structures, either posteriorly to the mediastinum, anteriorly to the chest wall or below to the diaphragm and therefore more or less fixed ("Symphyse pericardique," "chronic mediastino-pericarditis") that the movement of the heart is impaired. The resulting disturbances are purely mechanical and affect the heart, the venous circulation and the respiration. All symptoms and signs are directly referable to this "impediment to the passage of blood through and out of the heart" and to the interference with respiration during inspiration.

Pitt[23] suggests that the resulting interference with movement, size and efficiency of the heart, probably depends on whether the heart remains dilated a sufficient time to permit adhesions to become firm, in which case it can never contract. If, on the other hand, the heart adjusts itself while the adhesions are soft, permanent impairment need not result. Later, when the adhesions are firm and fibrous, the pericardium may be so completely fixed as to prevent subsequent dilatation. The exact mechanism by which the above mentioned results are brought about has been ably discussed by Keith,[24] Wenckebach,[25] and others.

Pick,[26] in 1896, described a form of adherent pericarditis accompanied by cirrhosis of the liver, extreme ascites without jaundice, and oedema of the legs, which is often mistaken for hepatic cirrhosis and to which he gave the term "pericardial pseudo-cirrhosis of the liver." Cases of so-called "multiple-," "poly-serositis," or "polyorrhomenitis", probably form a part of this same general group.

All cases of adherent pericarditis then fall roughly into one of three groups: first, those of simple fusion between the serous surfaces of the pericardium and which are usually without characteristic signs or symptoms and therefore seldom recognized clinically; second, those cases with adhesions of the pericardium internally and externally, the clinical picture of which is that of cardiac and respiratory failure; third, those cases of extensive intra- and extra-pericardial adhesions and also evidences of extensive general involvement of other serous surfaces.

Regarding the symptoms of adherent pericardium little need be said. They are essentially those due to respiratory embarrassment and to cardiac insufficiency. Cyanosis and dyspnoea are usually present in all severe cases. Orthopnoea is often seen. Pain is rare. General oedema sometimes occurs in the severest forms.

PHYSICAL SIGNS OF ADHERENT PERICARDIUM.

Although a considerable list of signs can be mentioned none are constant or if present, strictly pathognomonic. Practically all are, as in the case of the symptoms, the direct result of fixation of the intrathoracic structures, especially the heart; and therefore concerned especially with the circulation and respiration.

Depression of the chest wall over the whole or a portion of the precordial area may be seen, less commonly a moderate degree of bulging. Neither condition can be considered as characteristic of this form of pericarditis, however. The position of the apex beat is to a varying degree fixed, and Achelis[27] considers this defective displacement with change in position or respiration, of the first significance diagnostically. It is frequently considerably displaced outward as is characteristic of cardiac dilatation. More commonly than otherwise, it is raised, being palpable only in the third and fourth spaces, rarely also in the second. Marked variation in the nature, force and area over which the cardiac impulse is felt is also common.

Among the most trustworthy signs, if the heart be adherent to the anterior chest wall, is the retraction of the intercostal spaces with ventricular systole, usually most striking in the area of maximum impulse but often also over more or less of the entire precordia. Less constantly a systolic recession is to be observed in the epigastrium resulting from extensive adhesions between the pericardium and diaphragm. With the patient in a sitting position a common phenomenon is a retraction of the lower ribs in the left posterior and lateral aspects of the thorax, "Broadbent's sign." Broadbent[28] explains this as resulting from the upward displacement of the diaphragm with each systole of the heart, which pulls the false ribs inward. Rarely this sign has been observed by this author and others to be present with a greatly enlarged heart, but in such cases the movement varies with respiration, which never occurs when due to adhesions of the pericardium (McKenzie). In my experience, this sign, when present, is one of the most distinctive of adherent pericardium. Bramwell[29] regards the diastolic rebound or shock, often over the chest wall in the region of the palpable impulse, as highly characteristic. Similarly a systolic impulse may in rare cases be heard or felt posteriorly.

One of the most commonly described signs is the so-called "pulsus paradoxus," "pulsus inspiratione intermittens" or "Kussmaul's sign," that is, a variation in the pulse associated with respiration, the rate becoming slower and the force less with inspiration. The sign occurs in other conditions as well, and is by no means constant or definite in this form of pericarditis and therefore is of doubtful value.

Kussmaul[30] has called attention to the swelling in the cervical veins synchronous with inspiration, which he explains as due to the fact that the adherent pericardium prevents the dilatation of the right ventricle, which normally occurs during the first part of respiration. Sudden diastolic collapse of the jugular vein was described by Friedrich[31] and considered by him an important sign.

Auscultation yields nothing worthy of special mention. If the union of the visceral and parietal pericardial surfaces is not universal, a rub may be present. Betz[32] has described a "peculiar blowing or whistling systolic sound" which he regards as characteristic of adhesions of the pericardium to adjacent tissue.

X-RAY EXAMINATION.

It is hardly possible to emphasize too strongly the importance of an x-ray examination in the diagnosis and differential diagnosis of pericarditis. In all forms of inflammation of the pericardium with fluid exudate or adhesions, it furnishes in many instances more reliable data than either the symptoms or signs. It is true, however, as with other intrathoracic conditions, that the diagnosis should never be made on the x-ray findings alone, but only when these are considered together with the clinical symptoms and signs. There seems to be a general agreement among writers on the subject that the normal pericardium cannot be differentiated from the heart shadow, but Römfeld,[33] after a careful study of a large series of cases, concludes that the normal can be made out in about one-third.

Simple fibrinous changes in the pericardium give no positive x-ray findings. With small effusions into the pericardium the x-ray examination likewise furnishes no aid to diagnosis, but with larger amounts of fluid, certain features make the form of the heart shadow quite distinctive. With few exceptions, the outline of the shadow of the distended pericardium in the röntgenogram corresponds fairly closely to the area of dulness mapped out by percussion. The shadow is large, the outline rounded or more or less triangular in shape, depending on the amount of fluid. Its broadest part is below, often reaching the outer limits of the thorax on the left, and from three to twelve centimeters to the right of the median line. The obliteration of the normal acute cardiac-hepatic angle, so commonly shown by percussion, is never seen except in the cases with external pericardial adhesions in this region. In fact the normal acute angle is not infrequently accentuated. When viewed laterally the retro-cardiac triangle is greatly diminished or entirely effaced. The shape of the area varies significantly with changes in position. In contrast to the shadow of an enlarged heart, the pulsation usually observed at the left border is absent. Wessler[34] thinks this may also be the case in dilated heart. Above, the shadow is somewhat raised and encroaches on the great vessels at the base of the heart. In the upper one-third of the left border there is commonly a varying degree of concavity of the outline on the left, corresponding to the so-called "Sibson's notch." If combined with adhesions within the pericardium the outline of the distended sac may not be uniform and even marked bulging, especially to the left, is rarely seen (Wessler).

The x-ray appearances in adherent pericardium have been the subject of much careful investigation by Lehmann and Schmoll[35] Achelis,[36] Tornai,[37] Vaquez and Bordet,[38] and others, and the essential features appear to be well established. Much of a rather technical nature has been written, especially by the above observers, regarding the methods of x-ray examination, which does not fall within the scope of this paper. Uncomplicated obliterative pericarditis cannot be certainly demonstrated by röntgenograms.

The practical conclusions of the above authors as to the characteristics of adherent pericardium in röentgenograms may be summarized as follows:

1. With adhesions of the pericardium to the anterior wall of the thorax, the clear space between these two structures is much diminished or obliterated where an x-ray examination is made in the oblique or lateral position. Achelis urges caution in drawing too definite conclusions from such findings, as this obliteration may be present in the case of extreme cardiac hypertrophy.
2. The outer limits of the shadow laterally do not appear smooth and clear as in hypertrophy or dilatation of the heart, but are vague and indefinite and frequently with notched or toothlike outline due to adhesions.
3. The normal angle on either side between the pericardium and diaphragm is sometimes completely filled in by adhesions.
4. An indistinct or obliterated heart pulsation is seen.
5. Various modifications in the displacement shadow of the heart, with respiration and change of body position, are also characteristic.
6. The diaphragm shows varying degrees of immobility during respiration.
7. In the lateral position a posterior mediastinal pericarditis is shown by obliteration of the normal triangular clear space.

PARACENTESIS PERICARDII.

Whether for diagnosis or for therapeutic purposes aspiration of the pericardium is a procedure altogether too little known. During the past ten years many authors have urged the more frequent employment of paracentesis in pericardial effusions and in consequence it is now unquestionably much more often done than formerly.

Considering the relative frequency of pericarditis, and its favorable course with spontaneous recovery in many instances, it must be admitted that paracentesis is rarely necessary. It is indicated when the amount of effusion is so great as to give extreme embarrassment of the respiration and circulation and thus endanger life, or when a large effusion shows no tendency to absorption. In occasional cases it is important to establish the nature of the effusion, especially when a purulent exudate is suspected. Sears[39] has emphasized the importance of exploratory puncture in all suspected cases of this type, urging the advantage of early radical treatment of pyopericardium on the same grounds as of pus in the pleural cavity. The favorable results of surgical treatment by pericardiotomy during recent years offers a weighty argument for early aspiration for diagnosis.

Puncture of the pericardium is far less simple than of either the pleural or peritoneal cavities and is by no means free from dangers. A dry tap is not infrequent even when a considerable amount of fluid is present,—a failure which is explained by the fact that adhesions binding the heart to the pericardium may make it difficult to reach the fluid or because the exudate is apt to contain a large amount of fibrin with which the needle may become plugged. The x-ray examination is often of great value in indicating the position of the fluid in the pericardial sac.

The possible untoward results of paracentesis of the pericardium are several. A few cases are on record of sudden collapse and death immediately following it. The dangers of infecting the pericardium are but slight and can be disregarded if strict attention be given to asepsis. An ever present possibility is the puncture of the pleura and infection of this cavity if the pericardial exudate is purulent. The gravest complication but, fortunately, a rather rare one, is the wounding of the heart, leading to fatal haemorrhage. Boxwell[40] reports such a case where the ventricle and auricle were punctured and death resulted from hemorrhage. The dangers from this cause seem to be not so much from puncture as of tearing of the heart muscle by movement of the heart over the end of the needle.

The question of the best site for aspiration is a matter of wide difference of opinion and a great variety of points have been recommended. From the work of Zinn,[41] Blechmann,[42] Schaposchenkoff and Damsch,[43] and others, it is clear that the least amount of the effusion collects in front of the heart, the bulk of the fluid being in the posterior and left dependent portions of the pericardium. The right side of the diaphragm meets resistance from the liver and cannot be pressed down as on the left, where the resistance is less, and therefore the accumula-

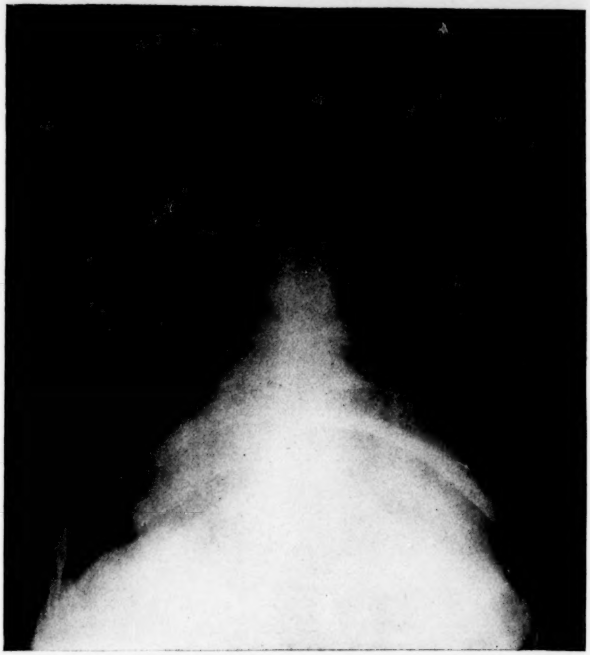

FIG. I.—MALE, 22 YRS. PERICARDITIS WITH EFFUSION (TUBERCULOUS).
Note enormous increase in transverse diameter of heart shadow, characteristic general outline, encroachment of shadow on great vessels, acute cardio-hepatic angle on right, and low position of heart on left.

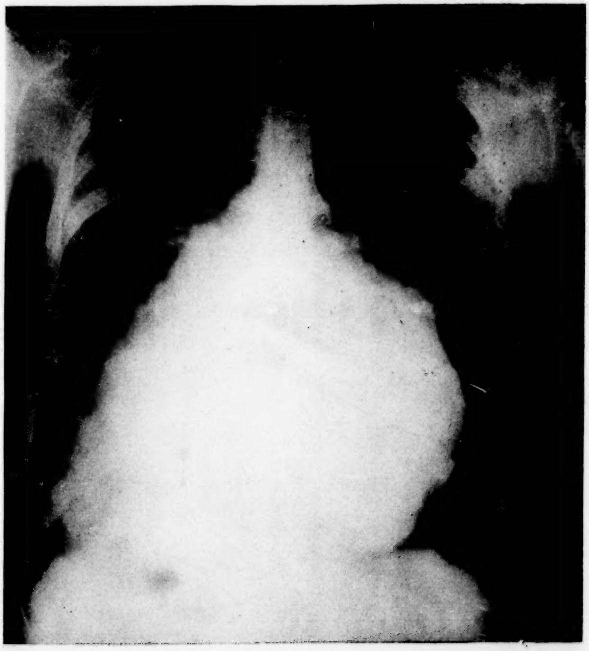

FIG. II.—MALE, 28 YRS. CHRONIC PERICARDITIS WITH EFFUSION, POSTERIOR VIEW (DR. FLOYD'S CASE).
Note same characteristics as in Fig. I.

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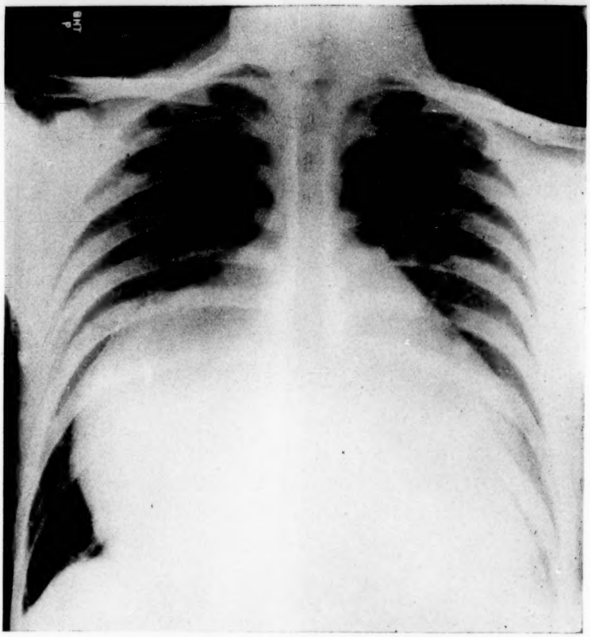

FIG. III.—SAME CASE AS FIG. II, BUT TWO MONTHS LATER.

Note striking increase in size of heart shadow due to increase in pericardial effusion.

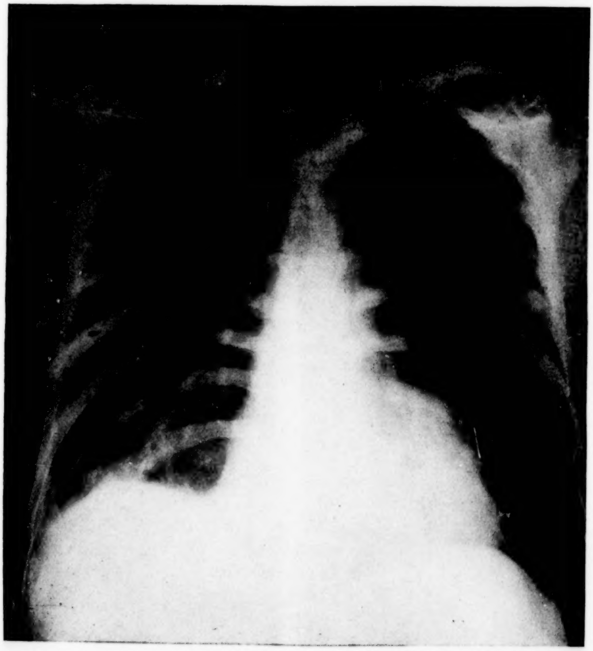

FIG. IV.—MALE, 36 YRS. ADHERENT PERICARDIUM WITH MODERATE EFFUSION FOLLOWING PNEUMONIA.

Note particularly the characteristic obliteration of the acute cardio-hepatic angle on right.

tion of exudate in the right lower part of the pericardium is usually small in comparison. This would seem sufficient reason for not choosing the fifth right intercostal space (Rotch's Point) as the site for paracentesis. Likewise for the same reason the various points to the left of the sternal border, either inside or outside the internal mammary artery, are unsuitable. Furthermore, the dangers of wounding the heart are greatly increased in this region.

The region most commonly chosen (Curschmann, Zinn, West, Sears, and many others) is the fifth or sixth interspace, 2-3 cm. outside the nipple line and inside the outer limits of dulness. The position is one of the most favorable for drainage of the pericardium and the chances of injury to the heart very slight. The needle introduced at this point may transfix the pleura, but this accident is of little or no importance.

One other point of puncture has come much in favor of late, namely, the sub-xiphoid of Marfan.[44] The advantages of this method as stated by Marfan are as follows. 1. The distended pericardial sac lies very close to the xiphoid and is very easily entered; 2. The sac is punctured at its lowest part and can therefore be more easily and completely drained; 3. There is no danger or injury to the heart; and 4. There is no possibility of entering the pleural cavity. Blechmann[45] and Rieux[46] believe this to be the most satisfactory and safest method.

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A SECOND NOTE ON THE FREQUENCY OF EPILEPSY IN THE OFFSPRING OF EPILEPTICS.

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SINCE publishing my early investigations concerning the Frequency of Epilepsy in the Offspring of Epileptics,[1] it has been my privilege to have the aid of a social worker to check up the results of my previous work. The fact that in only 8 of the 138 matings, where one or both parents were epileptic, did the offspring develop epilepsy was indeed surprising. Yet, when the ancestors of this same group were studied with the same point in view, direct similar heredity, there again were only eight cases, or 5.8%. But, as I explained in my previous article, the data I obtained were largely through correspondence and personal interviews with friends and relatives of the patients and, therefore, subject to many sources of error; and had they not diverged so widely from the only other similar research work, that of Echeveria,[2] I should have hardly considered them worthy of publication.

The following table will show at a glance to what a marked degree our results differed.

Investigator	Married Epileptics	Males	Females	Number Children Begot	Died in Infancy Convulsions	Epileptics
Echeveria	136	62	74	533	195	78
Thom	138	68	70	553	6	4

That 273 offspring out of a total of 533, or over 51%, should have developed epilepsy, seemed more startling to me than my own figures of only 10 epileptics in my total of 553 offspring, or less than 2%.

My purpose has been to make a more intensive study of the cases already reviewed, to determine, if possible, to what extent epilepsy is transmitted directly from parent to offspring. The 33 cases I wish to report include 7 of the 8 matings where the resulting offspring were epileptic, and the total of 10 epileptic children include 8 of those reported in my last paper. In other words, the field worker uncovered two more cases of epilepsy in her more exacting study of these 33 cases than I did by my less accurate method. Of these 33 cases, 13 were male and 20 female. Thirteen cases, including 11 females and two males, had their epilepsy before marriage; 19 cases, 11 males and 8 females, had their first convulsions after marriage. The 33 matings resulted in 133 offspring, 86 of whom are living and 47 are dead. Of the total of 133 offspring, there is a history of convulsions in 10, five having died in infancy during seizures, two becoming arrested cases and three confirmed epileptics.

The causes of death in the cases of the deceased were as follows:

Infantile convulsions	5
Diphtheria	5
Tuberculosis	5
Indigestion	5
Malnutrition	2
Scarlet Fever	1
Purpura	1
Meningitis	1
Unknown	9
Unascertained	13
	47

The present age of the surviving children is as follows:

Under 1 year	1
Between 1 and 5 years	10
" 5 " 10 "	14
" 10 " 15 "	10
" 15 " 20 "	11
Over 20 years	40
	86

This group of living offspring whose parents, one or both, were epileptic contains 46 cases still under 20 years of age, and in the epileptic zone. What per cent. of these cases will develop epilepsy no one can say at this time, but it is not probable that it will be 50%. Of the cases over 20 years of age, heredity will play a much less important part. So it appears that the results of the earlier work have been to a large degree substantiated by this more intensive study, and that the conclusion that epilepsy is less often transmitted directly from parent to offspring than we have heretofore been led to believe is justified.

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ARTIFICIAL HELIOTHERAPY: THE MERCURY-VAPOR-QUARTZ LIGHT A VALUABLE THERAPEUTIC AGENT.

BY JOHN BRYANT, M.D., BOSTON.

Is sunlight or is heliotherapy of real value in medicine? This question has been pretty conclusively answered in the affirmative. It appears that the live agent or active principle in producing the good results is the action of the blue rays in producing a pigmentation of the skin, the pigment then in some manner becoming a circulating metabolic rectifier; thus in Switzerland it has been noted that tubercular patients recovered, and that their prognosis varied with the rapidity and ease of pigmentation of their skins.

If blue light is the active agent, it follows that any method which delivers blue light to the skin is a valuable substitute for heliotherapy, the more so as any electrical method is always available, whereas the sun, at most, is available only at certain hours, even when not obscured by smoke, fog, or clouds.

It is known that the mercury-vapor arc generates plenty of short-length actinic rays. It is also known that quartz is a substance, and one of the very few, not opaque to the blue rays. It is, therefore, theoretically possible to produce a light which will deliver at the skin blue light not associated with excessive heat. At least one such lamp has been for some time available.

To produce pigmentation is to reproduce the effect and to promise the results of which actual sunlight is capable. The only question remaining, therefore, before being forced to admit the value of such a lamp, is whether it really does produce in action a rapid pigmentation of the skin exposed to its rays.

One of the lamps in question has been in use in my office since mid-August. Employed in connection with graduated heat from incandescent carbon filaments, as a metabolic stimulant for asthenic chronic intestinal cases, it has been clearly demonstrated that the light of this lamp actually does produce very rapidly a redness, even to blistering and peeling of the skin, and soon results in the acquisition of a pigmentation of the skin not to be distinguished from that obtained by much longer exposure to actual sunlight.

The lamp is, in fact, so active that a five-minute exposure at a distance of a metre or so may result in a sensitive skin turning, as one patient expressed it, "as red as a lobster," by the end of twenty-four hours.

Since many patients will find it not only more convenient, but actually a saving of time, to have their skins tanned by artificial heliotherapy, in a quiet room, regardless of the time of day or night, and since it is proved that the lamp does produce the all-important pigmentation, it is suggested that the use of such an apparatus might to great advantage become more general, not only in private practice, but in hospital circles. Used rightly, such a lamp is certainly a powerful and valuable addition to therapeutic resources, as an easily available and ever ready substitute for actual heliotherapy. Its indications would seem to be those of sunlight itself.

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Therapeutic and Preventive Medicine.

THE TREATMENT OF OBESITY BY A RATIONAL DIET.

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In the treatment of obesity, the object aimed at is the combustion of a definite amount of surplus fat in the body, and the prevention of its reaccumulation. Regulation of the diet constitutes the essential part of this treatment.

It would be an easy matter to calculate the formula for reducing the fuel value of the food intake, if oxidation in the body were always regular and uniform. In such case the amount of reduction would have a caloric value, equal to that of the quantity of body fat which it is desired to burn up. For example, if the reduction in weight desired is at the rate of two pounds a week, which means the combustion daily of about four and a half ounces of body fat, the fuel value of the daily ration would have to be reduced about 1000 calories below the normal for size, age and activity. But the oxidation of fat in the body is not always regular and uniform, and does not always respond promptly and fully to the demands made on it by partial starvation. Extensive variation of this oxidation in different individuals is a matter of common observation: frequently small eaters are seen to remain persistently stout, while large eaters as persistently remain thin. Nevertheless, the formula suggested serves as a basis on which to work out the best formula for the individual case.

Measures to improve oxidation in the body are called for in the treatment of obesity; and as all metabolic processes are more or less under control of the internal secretions, such measures are directed very properly toward improving the condition or action of the glands which produce those secretions. This means, as regards diet, regulation of the quality as well as quantity of the food, so as to diminish, in particular, the toxemias of alimentary origin which could injure those glands or disturb their functions. This is effected mainly by restriction or exclusion of articles of food of animal origin excepting milk and its products.

The following practical suggestions for regulating the diet in obesity seem in harmony with the facts and principles above alluded to.

Bear in mind that regulation of the diet is the principal thing in the treatment of obesity, and that this regulation should be qualitative as well as quantitative.

Insist on scales and measures being used to secure accuracy in carrying out the dietetic prescriptions.

Do not rely for protein chiefly on animal tissues and eggs, as is done in most obesity diets, but secure protein chiefly from milk and its products, which supply all the different amino acids needed by the body and are relatively easy of metabolism, being free from purins and comparatively insusceptible to putrefactive processes in the alimentary canal. If no other morbid condition is obviously present, a small amount of animal tissues or eggs may be included in the diet; but in cases complicated by obvious insufficiency of nitrogenous metabolism (as shown by gout, gravel, migraine, arteriosclerosis, chronic nephritis or hepatic insufficiency), or by disease of the alimentary canal, which increases the habitual production in that canal of putrefactive poisons and their absorption therefrom, the amount of flesh and eggs should be very small indeed or they should be excluded altogether. Such qualitative regulation of the protein ration for the special purpose of easing the burden of nitrogenous metabolism, is a cardinal principle in this method of treating obesity and its distinguishing feature.

Include plenty of fresh fruits and vegetables in the diet, in order to supply full rations of the body salts and vitamines; but use careful selection so as to include only fruits and vegetables which are comparatively free from objectionable qualities, such as indigestibility, possession of purin or oxalic acid content, and offensiveness to the patient's idiosyncrasies.

Allow water to be drunk in ordinary quantities.

Begin the treatment by restricting the fuel ration so as to supply about 1000 calories less than the minimum health ration for the particular patient.

Do not reduce the quantity of protein much below the minimum health ration, but let the loss fall chiefly on the fat and carbohydrate.

Do not, as a rule, try to reduce the weight by more than two pounds a week, on the average. Such a moderate reduction is not often attended with any unpleasant consequences.

Bear in mind the exceptions which exist in regard to reducing weight: be cautious in reducing the weight of those afflicted with serious diseases; relax the rigidity of the diet or discontinue all attempts at reduction, if in the course of treatment symptoms of distress or weakness appear (which does not often happen with this plan of treatment); and do not, as a rule, attempt to reduce the weight of those entering on old age who have been obese for a considerable time.

In most cases allow occasional periods of rest from the rigid diet, and while giving the minimum health rations, take note if the weight increases in consequence.

A series of dietetic prescriptions for obesity, devised by the writer in accordance with the above suggestions, have the food values shown in the index table given below. These prescriptions readily lend themselves to modifications for individual needs. The numbers in the main column of protein values refer to protein derived from milk, cereals, fruits and vegetables; and the numbers after the plus signs in the same column refer to protein derived from animal tissues and eggs. It will be seen that the protein derived from the latter sources is greatly restricted in this plan of treatment.

Index of Obesity Diets.

Prescription Number	Protein grams	Fat grams	Carbohydrate grams	Calories
I	50	32	112	975
II	50+4	36	113	1000
III	50+14	41	113	1100
IV	58	40	125	1125
V	58+4	42	125	1150
VI	66	44	136	1250
VII	62+14	48	125	1275
VIII	65+14	52	140	1375
IX	76	51	170	1400
X	76+14	58	170	1525

Clinical Department.

THE STREPTOCOCCUS MUCOSUS CAPSULATUS AS A CAUSE OF MASTOID DISEASE.*

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According to my experience the streptococcus mucosus capsulatus is the most insidious and destructive germ with which the otologist has to contend, and the question of an operation, when the mastoid cells are involved, is a most important one.

In 1905 Dr. George Sloan Dixon published in the *Archives of Otology*, Vol. xxxiv, Part 6, a paper entitled "Report of a Case of Panotitis Resulting in Meningitis, with Pathological Findings," in which he reported the case of a nurse who was under my care in the New York Eye and Ear Infirmary. She entered the hospital on February 7, 1904, and gave a history of an acute attack of otitis media which had begun six weeks previously. She had labyrinthine symptoms which, with the knowledge we have today, would have warranted an operation. There was no mastoid tenderness. On the fourth day after admission meningitis developed, and she died almost immediately.

In this paper Dixon says: "This case seemed to call for an examination of my bacteriological examinations during the past four years. They were found to comprise about 1050 cases of acute and chronic purulent otitis, with and without mastoiditis; 2.75% of the infections were Friedlander's pneumococcus, or, more properly, the bacillus mucosus capsulatus." Of 30 cases due to the bacillus mucosus capsulatus, 15 had existed for 42 days or over, before operation. Of these, two had perisinous abscesses with Bezold perforation; one had perisinous abscesses and cortical perforation with subperiosteal abscess; four had epidural abscess (one of which died of meningitis); one had panotitis and died of meningitis; and one had brain abscess and also died. Six cases had periosteal abscess.

Dixon further says: "Of those cases which had existed under 42 days, four promptly recovered after paracentesis, but mastoid operation was required on the remaining ten, and all did well except one patient who died of pneumonia."

Such a report only emphasizes the virulency of this germ, and since that time I have taken particular pains to watch these cases most carefully, especially with reference to an early operation.

During the years 1914-1915, I had the four following cases in private practice:

Case 1 was that of Caroline R., aged 5, who was seen by me in consultation on May 12th. She had had lobar pneumonia one month before when both ears had been affected, and there had also been an acute inflammation of the throat and enlarged glands in the neck. The right ear had cleared up, but the left had been discharging for about three weeks. The left membrane had ruptured spontaneously two weeks before I saw her. There was slight tenderness over the mastoid tip, the temperature had been rising, a little higher each day, from 99.2° in the morning to 101 or 102 in the afternoon, and a culture showed that the streptococcus mucosus capsulatus was the cause of the infection. A simple mastoid operation was performed that same day at the Infirmary. As soon as the tip was opened pus poured out. There was a very large cavity and the whole mastoid cells were involved; softened bone and granulations were everywhere. The wound was dressed in the usual way and the child made an uneventful recovery. Her temperature was 99° before the operation.

Case 2 was that of S. L. P., aged 64, who came to me on April 15th, complaining of pain in the right ear, and giving a history of a feeling of fulness in that ear three days ago. Examination showed the membrane slightly red and swollen about the short process as well as the canal. There was also slight tenderness on pressure over the mastoid. He was given drops to use, but as the pain was not relieved,

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* Read at the annual meeting of the American Otological Society held in Washington, D. C., May, 1916.

I opened the drum membrane under gas that same evening. Some serous fluid and gas escaped. He was then directed to douche the ear frequently during the day. The pain seemed to yield to treatment, and he was apparently doing well until three days later when the ear stopped discharging and began to pain again. The patient felt very dizzy and almost fainted on attempting to rise on the morning of April 19th, and that afternoon the drum membrane was again incised under gas. On the 20th the ear was discharging freely and there was practically no dizziness. An x-ray picture showed cloudiness of the mastoid cells on the right side, and a culture showed the cause of the infection to be the streptococcus mucosus capsulatus.

The ear discharged very freely until April 22d, when the perforation closed. On the 24th the patient felt very much better after the best night he had had for a long time, and the drum membrane seemed to be clearing. On the 26th of April it became necessary to open the drum for the third time. On the 29th there had been but a slight discharge, and the patient seemed to be in about the same condition as he was ten days before. A second x-ray plate showed a slight increase of cloudiness on the affected side.

A consultation with Dr. Lewis and Dr. Townsend was held, and Dr. Lewis and I strongly advised operation, which was done at the New York Eye and Ear Infirmary on April 30th. The usual incision was made. The bone of the outer cortex was extremely hard and very thick. The large tip cell was filled with pus and granulations, and the rest of the mastoid contained granulations and softened bone and some pus. The antrum was large. Everything was cleaned out and the wound packed with sterile gauze. The patient left the hospital in a little less than two weeks, and his recovery was steady though a little slow. The wound was dressed in the usual way, and gradually filled up. By June 11th there was one spot of bone still uncovered near the tip and there was a small sinus at the tip leading into the soft tissues. That morning the patient came into my office with marked swelling, extending down into the neck, which had come on suddenly the night before. This seemed to be caused by about a half teaspoonful of pus which I squeezed out of the same sinus, and by the next day the swelling had practically subsided except around the tip.

The patient went away for the summer and was under the care of a local physician. He had been very much run down, and this was undoubtedly the cause of the slow healing of the wound. The change of air to the country greatly improved his general health, and on his return to the city the wound was entirely healed and had been so for about a month.

Case 3 was that of J. W. A., who has been a patient of mine for a number of years, suffering from a chronic middle-ear catarrh on both sides, and exostoses in each auditory canal. On December 20th I was called to see him by his family physician, as he had a severe cold and pain in the right ear. On examination I found some vesicles filled with blood in the canal, which prevented a good view of the drum membrane. He was directed to syringe the ear every two hours with a solution of boric acid. The next afternoon, as the temperature suddenly went to 101° after being normal in the morning, and as there was some tenderness over the lower third of the mastoid bone, especially at the tip, I incised the drum under gas. After the incision the temperature was normal, but the discharge became more profuse and purulent and the tenderness over the mastoid was quite marked, especially over the tip. A culture was made and showed that the streptococcus mucosus capsulatus was the cause of the infection. A blood count showed the polys as high as 78%, and the leucocytes ranging from 5000 to 6000.

An operation was performed at the New York Eye and Ear Infirmary on December 25th. The usual incision was made. Pus was found under pressure in a large cell in the lower third of the mastoid. The outer cortex was very hard, especially over the antrum. A very large antrum was filled with soft bone and many granulations. The dura was uncovered to a very small extent in the middle fossa. The wound was packed with iodoform gauze in the upper part, over the dura, and with plain gauze in the lower part.

The patient left the hospital on January 8th, and the wound was dressed in the usual way. He was considerably prostrated by the infection which seemed to pull him down very much, and as a result the wound was slow in healing. By the first of March it was practically healed and the patient went South. He returned the first of April, greatly improved in his general health and with the wound in excellent condition. The hearing of the right ear is practically the same as that of the left, though that of both is somewhat impaired, owing to his old catarrhal trouble.

It is interesting to note, in connection with this case, that a urinalysis, made just before the operation, showed the presence of some albumin and a few casts evidently due to the poison, as an analysis made a month previously showed no abnormal conditions.

Case 4 is that of Paul B., a medical student, who was seen by me in Roosevelt Hospital in 1914. He had an acute inflammation of the ear which was due to the presence of the streptococcus mucosus capsulatus. The ear had discharged spontaneously before I saw him, and there was slight tenderness over the mastoid bone. Five x-ray plates were taken of the mastoid bone. The first three plates were cloudy but the fourth showed a less cloudy appearance and the final one was so much cleared up that I decided not to operate, as the drumhead had resumed its normal appearance and all tenderness on pressure over the bone had disappeared.

The following cases are a few of those treated in my clinic at the New York Eye and Ear Infirmary during 1913, 1914 and 1915:

Case 1. Barney G., a Russian, aged 53 years, came to the Infirmary on May 31, 1913, and gave the following history: Pain in the right ear began six weeks ago, following a cold. He suffered pain every night for over four weeks, and two weeks ago noticed a slight purulent discharge which has continued up to the present time. The drum membrane was incised in the clinic, and on the next day a post-auricular swelling appeared and gradually increased in size. Examination showed slight discharge from the right ear, the superior wall sagging, the drum membrane red and bulging, and a perforation in the lower part. There was tenderness on pressure over the mastoid area, especially over the antrum. A culture was made and found to be the streptococcus mucosus capsulatus. An x-ray plate showed the left mastoid clear, with large pneumatic cells. The right seemed to be completely disorganized; two localities suggested perisinous and epidural abscesses,—the former below and the latter near the knee of the sinus. Three days after admission to the hospital a simple mastoid operation was performed and soft pneumatic cells were found with large perisinous and epidural abscesses. The tip was also removed. The temperature on admission was 99.2°; after the operation it rose to 101.6° but gradually came down to normal. The patient was discharged from the hospital on June 14th, and the subsequent dressings were done in the out-patient department.

Case 2. Thomas D., Irish, aged 55 years, was admitted to the Infirmary on October 21, 1913. His illness began on August 15th, with a severe attack of pain in the left ear which continued until the drum ruptured, twenty-four hours later. Following that there was intermittent discharge and occasional attacks of pain, none of which was severe, and he was advised to come into the hospital because of the discharge and tenderness over the mastoid. A bacteriological examination showed the streptococcus mucosus capsulatus. The x-ray showed the right mastoid with moderate-sized cells of the pneumatic type; the cells were clear. The left mastoid seemed to be similar, but very cloudy. The sinus was far forward and looked as though it might be under the canal. A simple mastoid operation was done October 21st, revealing a large perisinous and epidural abscess, and a mass of dark necrotic granulations filling the antrum. The dura under the middle fossa was exposed and the sigmoid sinus for a considerable space. The temperature was 96.2° on admission, and immediately after the operation went to 101°, fluctuating between that point and 98° for four days until it became normal. The patient was discharged from the hospital on November 6th, and after that was dressed in the out-patient department.

Case 3. Fred G., an American, aged 21, was admitted to the hospital July 25, 1913. He gave a history of pain and deafness in the right ear on July 7th, following sea bathing. The drum membrane ruptured and he came to the clinic the next day with a profuse discharge from the ear. He was admitted to the hospital for observation and the drum membrane was freely incised. There was slight sagging of the posterior wall and moderate pain. Examination of a smear showed strong suspicion of a streptococcus mucosus capsulatus, but Dr. Dixon could not be sure of it. The x-ray showed a moderate-sized pneumatic mastoid left, with extensive development of zygomatic cells, all of which were clear. The right side was cloudy throughout. The sinus seemed superficial and there were perisinous and epidural abscesses. The usual operation was performed on the right ear on July 31st. The bone was of the large pneumatic cell type filled with soft necrotic granulations. A large extent of dura was exposed, and the sinus was exposed and healthy. The tip and zygomatic cells were carefully cleaned out. The patient was discharged on August 8th, and treated afterward in the clinic.

Case 4. Rose K., a Russian, aged 21, was admitted to the hospital on September 2, 1913, with a history of pain in the left ear five weeks before, following a cold. The drum had been incised one week before, and since then there had been a slight purulent discharge. Pain had been severe for the past few days with pain behind the auricle. Examination showed the left ear filled with thick pus. The drum membrane was bulging and perforated with sagging of the posterior superior wall, and there was slight tenderness on pressure over the mastoid antrum and tip. A bacteriological examination showed the cause of the infection to be the streptococcus mucosus capsulatus. The x-ray showed the right to be a moderate-sized clear pneumatic mastoid, with a number of zygomatic cells. The left was of the same type, but very cloudy throughout. Operation was advised, but refused, and the patient left the hospital on September 7th.

She came to the Infirmary again on September 13th, and on the 16th a simple mastoid operation was done on the left ear. The outer cortex was rather thick, and the bone was of the moderate-sized pneumatic type. There was no free pus. There were necrotic granulations and the bone was broken down. The zygomatic cells were cleared out and the tip was removed, and a small area of dura in the antrum and middle fossa was exposed. The patient was discharged on October 2, 1913, and treated afterwards in the clinic.

Case 5. Adolph R., a Roumanian, aged 59, came to the Infirmary on June 3, 1913. His trouble began three months before, following exposure to cold. He had pain in the left ear for the first eight days and then had no further trouble, except an occasional rumbling noise, until two days before he came to the clinic, when the pain recommenced with a discharge. Examination showed a slight foul discharge from the canal, the membrane red and bulging, with slight sagging of the posterior and upper canal wall. There was no mastoid tenderness. The patient had diabetes. The bacteriological examination showed that the infection was due to the streptococcus mucosus capsulatus. A blood count showed the white cells, 7100, and the polys 61%. The x-ray showed the right mastoid to contain large pneumatic cells. The left was of the same type but cloudy throughout, disorganized below and behind, and probably an epidural abscess near the knee. There were high zygomatic cells. A simple mastoidectomy was done. There was very extensive destruction of the cells, pus in the antrum and tip, and both an epidural and a perisinous abscess found. The patient made a good recovery.

Case 6. Jacob S., an American, aged 19, came to my clinic on November 19, 1912, with acute pain in the right ear of one week's standing. The membrane was red and bulging and was incised. The pain was relieved at once. There was little, if any, discharge. On December 30th, the patient noticed pain over the mastoid and the discharge increased in quantity. He came to the clinic again on January 5, 1913. Examination of the right ear showed a slight, thick discharge in the canal, which was constricted throughout and sagging in the posterior and upper portion. There was a small perforation in the drumhead, and slight tenderness over the mastoid antrum on firm pressure. The cause of the infection was the streptococcus mucosus capsulatus. An x-ray showed both mastoids to be of the large-celled pneumatic type, the right being hazy throughout, especially above and behind the antrum. The temperature was 98°. A simple mastoid operation was performed and free pus was found in the antrum and tip. There was a perisinous abscess. The patient was discharged from the hospital on January 14th, and treated in the dispensary.

Case 7. Christian S., a Greek, aged 30, came to the Infirmary on June 23, 1914, with a history of continuous and moderate discharge of one month's duration. He had had no severe pain. There was diffuse post-auricular tenderness and considerable sagging of the upper and posterior wall of the canal. The drum membrane was almost occluded. The bacteriological examination showed the streptococcus mucosus capsulatus. The x-ray examination showed a large clear-celled pneumatic mastoid on the right, and on the left the same type, but cloudy throughout. On operation an epidural abscess was found and a large area of dura was exposed. The sinus, covered with granulations, was also exposed. There was a very extensive and destructive process. The temperature was 99° on admission, and after the operation went to 100.3°. The patient was discharged on July 13th, and treated subsequently in the clinic.

Case 8. Mary A., an Austrian, aged 36. Her illness began with severe pain in the left ear following a chill, four weeks before her admission to the hospital on September 8, 1914. The pain gradually increased in severity until the drum was opened. Her temperature on admission was 99.2.° The cause of the infection was the streptococcus mucosus capsulatus. Operation showed the diploetic type of bone. The entire process was extensively involved, and there was a perisinous abscess. There was no involvement of the posterior sinus cells. The tip was removed and a large area of dura was exposed. The patient left the hospital on September 17, 1914.

Case 9. Max B., an Austrian, aged 32, was admitted to the Infirmary on May 18, 1915. He gave a history of pain in the left ear 10 days before. Two days after the pain began he came to the clinic and the drum was incised. Discharge continued until the day before his admission to the hospital when it ceased, and the pain began again. There was great tenderness on pressure over the tip, some constriction of the canal, and the drum membrane was swollen, reddened, congested and bulging. The bacteriological examination showed the presence of the streptococcus mucosus capsulatus. The x-ray plates showed a large mastoid, right, with extensive zygomatic cells. Cells were also present about the antrum. The left was a very large pneumatic mastoid, comparatively cloudy. The report from the laboratory characterized this as "probably an operative case." His temperature on admission was 101.° The operation revealed the cells filled with pus, and great destruction of the bone. The large tip cells were filled with pus under pressure. The sinus was covered with granulations forming a perisinous abscess. The patient left the hospital on May 28.

Case 10. David D., a Scotchman, aged 68, came to the hospital on June 18, 1915. He first had pain in his left ear five weeks before. The drum was incised one week later and again three weeks after that. Two days after the last incision he developed severe pain in the ear and tenderness posterior to the auricle, and the discharge became more profuse. There was tip tenderness over the mastoid and a thick purulent discharge. A linear perforation was seen in the drum membrane. The laboratory reported the presence of the streptococcus mucosus capsulatus. The x-ray showed both mastoids of the pneumatic type with thick cortices. The right was fairly clear and the left quite cloudy. A simple mastoid operation was done on the left ear, and the mastoid cells were found filled with granulations and pus. The tip was completely removed. No sinus or dura was exposed. The temperature on admission was normal. The patient was discharged on June 30, and treated in the clinic.

Case 11. Herbert F., an American, came to the clinic on March 4th, 1915, with a history of slight pain three weeks before. The ear had felt stopped up and deaf, and finally had ruptured spontaneously. Slight pressure over the tip caused pain. There was no sagging of the canal wall. The discharge was moderate. There was marked bulging of the drum membrane. A culture showed that the streptococcus mucosus capsulatus was the cause of the infection. The x-ray showed the right mastoid to be a moderate-sized clear pneumatic. The left was of the same type, but cloudy throughout. The usual mastoid operation was done. There was extensive involvement of the mastoid cells, which were filled with softened bone, granulations and thick pus. The temperature was 100 on admission.

From an analysis of these cases it will be seen that some patients complained of slight pain, and others of very severe pain, but that there was extensive destruction of the mastoid cells in all cases that came to operation, particularly in the hospital cases. There was both a perisinous and an epidural abscess in seven of the eleven hospital cases, and in two others the dura was exposed. In two of the private cases, also, the dura was exposed.

The x-ray is a most valuable aid in deciding upon the advisability of an operation. If a mastoid, which was previously shown to be cloudy, begins to clear up, and the symptoms show a steady improvement, I feel that we can afford to wait if the patient is carefully watched, and if a sufficient number of x-ray plates are taken. Such was the method pursued in the case of the patient who escaped operation. If, on the other hand, a patient is under treatment and the discharge persists while all tenderness on pressure over the bone has disappeared, it is more than likely that a destructive process is going on in the mastoid cells, and we are likely to find an exposed dura and sinus, particularly if the condition continues for from three to six weeks. A blood count is generally of little value.

In concluding, I desire to draw attention to the following points:

1. The patient may have very severe pain, or the pain may be slight, and the temperature is seldom much above normal.

2. Tenderness on pressure over the mastoid process may be well marked, or there may be none, especially where the outer cortex is thick.

3. The discharge in some cases is very profuse, while in others it is slight, and there may

or may not be sagging of the posterior and upper canal wall.

4. The x-ray is a most valuable aid, as the cells on the affected side will be cloudy, and in some instances it is possible to detect an epidural or perisinous abscess.

5. We should err on the safe side and operate when in doubt, for we often find a great destruction of bone, even in cases that present few symptoms. It is only in a few cases, which yield readily to treatment, that an operation can be avoided.

◆

A CASE OF DOUBLE EMPYEMA SUCCESSFULLY OPERATED UPON, WITH REMARKS UPON LOCALIZATION.

By F. B. Lund, M.D., and H. Morrison, M.D., Boston.

This case of double empyema, is reported because of the rarity of double empyema,—at least of case reports thereof,—and because of the interest attached to the localization of the abscesses, which was quite different upon the two sides.

A girl of 16 was attacked on March 30, 1915, by epigastric pain, vomiting, headache, and slight cough. At Dr. Morrison's first visit her temperature was 102, pulse 120, and respiration 30. Examination showed signs of beginning consolidation at the base of the left lung. The following morning there were signs of frank consolidation of the left lower lobe.

From the very first, this patient looked very sick. On April 1st, her leucocyte count was only 5,000, showing her poor resistance. On April 2d,—the fourth day of the illness,—there was involvement of the right lower lobe; and by the end of the ninth day, the middle and lower lobes of the right lung and the lower lobe of the left were solid. The girl was obviously septic. Her leucocyte count had risen to 23,000. The temperature ranged from 100°-101° F., mornings, to 103°-104°, evenings. There was slight cyanosis, with considerable dyspnoea. The pulse was rapid; the systolic blood pressure was 115. Cardiac stimulation had been instituted early in the disease. There was considerable cough, and the sputum was muco-purulent and very tenacious.

The expected crisis failed to appear during the next six days. The patient was prostrated; she was running a septic temperature and was beginning to perspire freely. At both bases and the axillae there had developed flatness below the level of the angle of the scapula with distant bronchial breathing and bronchophony. Above this zone were fine crepitant râles. Both Dr. E. A. Locke, who was called in consultation, and Dr. Morrison felt convinced that there was fluid in the chest, probably pus, but they were uncertain whether it was in one side or the other, or both.

On April 14, the fifteenth day of her illness, she was sent to the Boston City Hospital, with the provisional diagnosis of double empyema. An x-ray examination at that time showed increased density in the left lower lobe, suggesting consolidation rather than fluid. Dr. Lund then did paracentesis in both sides of the chest, in two places in each side, with no result. For the next three days the patient's condition remained unimproved. On April 18, she began to cough up a great deal of foul pus, without relief, however.

On April 21st the left chest was again tapped. This time a few drops of thick pus were obtained through the needle inserted in the ninth interspace in the posterior axillary line. Resection was done of an inch of the ninth rib, with the evacuation of several ounces of thick foul pus, similar to that which the patient was expectorating, found as a thin layer between the lung and the chest wall. Drainage was established through a rubber tube inserted obliquely, with the skin sutured over the end to act as a valve.

On the following morning the patient's condition had not improved, and the right pleural cavity was explored a second time. A needle inserted through the tenth interspace near the spine, and directed upward, obtained a few drops of pus. The tenth rib was resected near the vertebra, and a few ounces of foul pus were found between the right lung and the spine. Drainage was established through a rubber tube.

The patient began to improve at once. There was profuse drainage through both tubes. The cough and expectoration subsided gradually. The sputum never showed any elastic tissue fibres. The temperature reached the normal level by the middle of May, 1915. The pulse rate remained elevated for another month. By the end of May, both wounds were granulating, and there was very little discharge through the small sinuses. On May 29th, an x-ray examination showed no evidences of fluid in the chest; there was some haziness throughout both lungs, but they were well expanded.

Through the summer, the patient improved steadily. She gained in strength and weight. Cough and expectoration ceased entirely. Both lungs became clear and expanded well; the chest became symmetrical.

COMMENT.

This is a case of double empyema following pneumonia. As judged from the series of cases of empyema collected by Dr. F. T. Lord[1], one case in fifty is bilateral.

On April 18, 1915, when this patient began to raise fetid pus in large quantity, there was a perforation of the lung tissue. The pus expectorated and the pus evacuated surgically were identical. Osler[2] speaks of perforation into the lung as one of the natural modes of cure of empyema. He quotes from an article by Traube, published in 1872, entitled, "On a Natural Mode of Cure in Purulent Pleuritic Exudate." There appear two ways in which an empyema may discharge through the lung: first, by opening into a bronchus and the formation of a fistula; and secondly, by a local necrosis of the pulmonary pleura, exposure of the parenchyma, and a soakage of pus through the spongy lung tissue into the bronchi. In the first way, pneumothorax usually, though not often, develops, and aggravates the danger. In the second way, pus is usually discharged without the formation of pneumothorax, and must be regarded as one of the most favorable modes of termination in empyema. We believe that in the case here reported, the perforation of the lung was of the second type, but the drainage so established by nature was insufficient to bring about a cure without surgical assistance.

It is worthy of note that the pus in the left pleural cavity was a thin layer between the lung and the chest wall, and in the right, between the lung and the spine.

The x-ray plates in this case, although there was a definite localized empyema on either side, showed merely a general haziness of the lower part of the chest. The position and outline of the cavity were not shown distinctly on either side. Percussion, also, failed to localize the cavities. It is easy to see why this was the case on the right side of the chest, where the cavity lay in an unusual position,—between the mesial surface of the lung and the spine and vertebral portions of the ribs. The neighborhood of the spine, vertebral muscles, and rib angles in this position make it very difficult to detect a thin, flat cavity. The cavity on the left, though superficially situated, was not large, and was so localized that a needle pointed in the usual direction, upward and inward from the ninth interspace and posterior axillary line, failed to strike it. Aspiration higher up also failed the first time it was tried.

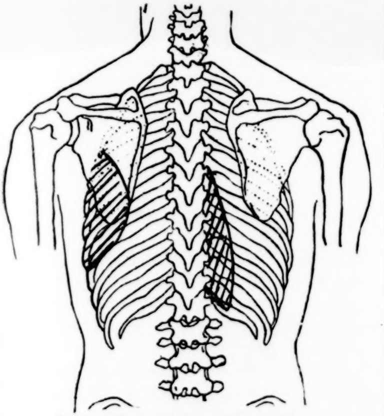

Fig. 1.—Showing position of pus cavities.

It is an interesting question, whether, when the history and physical signs strongly favor the presence of pus, but aspiration is negative, the chest should not be opened and a search under the guidance of the finger made. Granted that the needle is the right size and intelligently manipulated, aspiration may be negative. Being negative in this case, it was repeated on both sides in two places, although the chest was not opened until one week later. Repeated aspiration, however, may be dangerous. Alarming hemorrhage has followed such aspiration in the hands of one of the writers in two cases. In one of these, the chest was opened and the pus found while the hemorrhage was going on, the tapping being negative as far as pus went. It is interesting that in this latter case, operation showed the pus in the same place as in the case reported, namely, between the inner surface of the lower lobe and the chest wall. The deeper the needle is pushed into the lung, the greater the danger of the serious hemorrhage which may result from wounding one of the large arteries near a bronchus. The oftener repeated the aspiration, the more danger of deep or careless work. It is so easy to *miss* a localized empyema or an abscess, that we believe when the physical signs and history are positive, one should open the chest and push about with one or two fingers. Pushing the lung from the chest wall cannot cause serious hemorrhage, and an empyema cavity always lies between the lung and the wall, except in the rare interlobar empyema which always in the writers' experience comes up near the surface of the lung.

A lesson from this case and the case mentioned which was complicated by hemorrhage, is never to be satisfied with a negative result till you have explored the space between the inner surface of the posterior lobe and the spine. The problems of localized empyema are more interesting and difficult than the so-called general empyema, which is found at the base of the lung behind, and in which there is no difficulty in finding the pus, as it lies just beneath the ribs at the point of election for tapping, namely, the ninth interspace in the posterior axillary line.

The x-ray has occasionally been of the greatest assistance, but, as stated above, was of no value in this case.

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[1] Frederick T. Lord: Diseases of the Bronchi, Lungs and Pleura. 1915, p. 520.

[2] William Osler: New York Medical Record, Oct. 20, 1883.

A CASE OF BLOODY TEARS.

By M. J. Konikow, M.D., Boston.

The extraordinary rarity with which bloody tears are seen in general practice may possibly justify the report of the following case:

A. M., 50, painter. Has been in good health, except for the last few months during which he had several attacks of slight nosebleeds. One of such nosebleeds started a couple of hours before I saw him. Ordinary means previously employed by him and members of his family had proven unsuccessful, and the physician's aid was sought.

Blood was freely flowing from the right nostril. An anterior tamponade failed to stop it, merely directing the flow backward. A complete stoppage of the flow was obtained only by a combined tamponade, anterior and posterior.

A few minutes after I succeeded in stopping the nosebleed, large bloody tears began to run down the cheek from the right eye. Pressure, however upon the right nasal duct stopped this flow.

Of course, the source of these "tears" came from the blood that was caught between both tamponades and was forced into the nasal duct. So, physiologically, these "tears" were not tears at all, but the product of the backflow through the nasal duct.

True sanguineous lacrymation, *i.e.*, bloody tears produced directly by the lacrymal gland, is an extremely rare occurrence, and it is doubtful if it ever exists.

The *Index Medicus* mentions a few authors only who have reported cases of sanguineous lacrymation. F. R. Cross[1] reported a case of a girl of 21 who for several years had been suffering from bloody tears coming occasionally from the left eye. By excluding any other source, this writer thought the lacrymal gland responsible for this phenomenon. Hasner[2, 3] reported two cases of bloody tears, one in a girl of 13 who was exhibiting this phenomenon during the two years preceding her first menstruation; the other in a healthy young butcher where the cause of the trouble was located in a lentil-sized polyp of the upper conjunctiva. S. W. Ochapowski[4] reported a case of bloody tears, the cause of which he placed in the general hysterical character of the patient. With R. Spelleers[5] and R. Cross,[6] who reported similar cases of bloody tears, the literature on this subject is almost exhausted.

That bloody tears are not met with frequently, my own case fully confirms. In my twenty-three years as general practitioner this was the first case I came across.

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[3] Hasner: *Ibid.*, No. 1, 1861.

[4] Ochapowski, S. W.: A Case of Bloody Tears Due to an Hysterical, Functional Affection of the Eye. Russky Wratch, 1902, i.

[5] Spelleers, R.: Over gekleurde tranen. Nederl. Tijotschr. v. Geneesk., Amsterdam, 1907, ii.

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Society Report.

BOSTON SURGICAL SOCIETY (INCORPORATED).

TENTH MEETING.

A clinical meeting of the Society was held on Monday, February 7, 1916. at the Peter Bent Brigham Hospital, at 10 a. m.

Dr. Cushing demonstrated a series of interesting cases as follows:

1. Cerebellar tumor. (This case was operated upon later before the Society.) The patient showed loss of vision and choked disc. The fundus was demonstrated to the members of the Society by a new binocular ophthalmoscope.
2. Cerebellar tumor. Two weeks after operation; beginning to sit up for first time in six months.
3. Endothelioma, with Jacksonian epilepsy. A previous exploration in Chicago had failed to discover the tumor, which lay near to the vertex. Much subjective improvement after removal of the tumor.
4. Solid pituitary tumor with huge hernia of the brain, following decompression done at the Massachusetts General Hospital. Trans-sphenoidal operation done by Dr. Cushing disclosed an irremovable pituitary tumor.
5. Internal hydrocephalus. Decompression done in Chicago. Trans-sphenoidal operation by Dr. Cushing showed a dilated third ventricle with internal hydrocephalus.
6. Pituitary tumor with internal hydrocephalus. Similar to Case 5.
7. Ductless gland syndrome, probably pituitary. Male with feminine characteristics. Decompression with relief of long standing headache.
8. Headache of typical pituitary character. Coincident diabetes. Case under investigation.
9. Pituitary tumor. Female. Headache; blindness in one eye, and hemianopsia in the other. Under investigation.
10. Dislocation of the atlas. Traumatic. Six months' duration. There was some numbness of the hands. X-rays showed the lesion plainly. At operation reduction could not be accomplished, but the spinal canal was enlarged to relieve pressure. Marked improvement.

There was a lantern slide demonstration of specimens of brain tumors.

Following the demonstration Dr. Cushing operated on Case 1, cerebellar tumor; and Dr. John Homans operated on a case of gallstones and pancreatitis, with drainage of the gall-bladder and of an abscess in the region of the head of the pancreas.

The meeting then adjourned.

(Signed) L. DAVIS,
Acting Secretary.

Book Reviews.

Progressive Medicine. Edited by HOBART AMORY HARE, M.D., assisted by LEIGHTON F. APPLEMAN, M.D. Vol. xix, No. 3, September, 1916. Philadelphia and New York: Lea & Febiger. 1916.

This quarterly issue of a standard digest of advances, discoveries and improvements in medical and surgical sciences, contains reviews of diseases of the thorax, the skin, the nervous system, and obstetrics. The latter constitutes half the volume and is an elaborate summary of recent literature on the subject. The section on dermatology includes also recent experience with arseno-benzol and diarsenol in the treatment of syphilis, and is illustrated with a dozen excellent cuts. The section on the thorax includes diseases of the heart, lungs, blood vessels, blood and circulation. The volume is a valuable collection of important recent contributions to the literature on the subjects in question.

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126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

TWO IMPORTANT LEGAL DECISIONS.

IN the weekly report of the United States Public Health Service for September 29, 1916, is recorded a recent important decision by the Michigan Supreme Court, relative to administration of the Workmen's Compensation Act. In the case of a workman injured by a sawmill accident, the employer refused to make compensation payments longer than nineteen weeks, on the ground that the employee's protracted disability was due to retardation of healing by preëxisting syphilis. The claimant denied that he had ever had this disease, and the Industrial Accident Board, adjudicating the matter, found that there was no suggestion of active disease in the applicant, prior to the injury. The diagnosis of syphilis was based on an unsworn laboratory report, whose validity was evidently called in question. The Board made no definite decision whether the period of the claimant's disability was or was not extended by the presence and action of the disease, but declined to relieve the respondent for the following reasons, as stated in the written opinion of its council.

"The legal question presented by the petition is an important one. If the correct rule for determining the length of time compensation for disability should be paid in case of an injury of this general character is found to be the one contended for by respondents, the result will be far-reaching. The question then to be determined in cases of continuing disability would be whether the injury should have healed, or whether it should have healed more quickly than it did, instead of the actual resulting disability. Instead of the plain question of fact as to the nature and duration of the disability which the injured man actually suffered, it would present for decision the question as to how much he should have suffered, and how soon he should have recovered, upon the theory that only a part of the disability was due to the injury, and the remaining part due to disease. In the opinion of the Board, the respondents' contention must fail. The compensation law does not fix any standard of physical health, nor does it make any exceptions for cases of injuries to men whose health is impaired or below the normal standard. Neither does it except from the benefits of the law the man who carries in his body a latent disease which, in case of injury, may retard or prevent recovery. The law by its expressed terms applies to every man who suffers disability from injury. It does not exclude the weak nor the less fortunate physically, but was intended for the workingmen of the State generally, taken as they are."

In awarding its opinion on this case, the Supreme Court commented in part as follows:

"We agree with the Industrial Accident Board that under the circumstances of this case the act does not contemplate any such apportionment of the period of disability as respondents ask for. Assuming that such disability is being prolonged by the disease, there is yet no point at which the consequences of the injury cease to operate. It is the theory of respondents, not that the consequences of the injury cease, but that they are prolonged and extended. There is no part of the period of disability that would have happened, or would have continued, except for the injury. The consequences of the injury extend through the entire period, and so long as the incapacity of the employee for work results from the injury, it comes within the statute, even when prolonged by preëxisting disease.

"The order of the Industrial Accident Board is affirmed."

On October 3 the Court of Appeals of Albany, N. Y., handed down a decision permitting the practice of healing by Christian Science without a license, holding that, while the practice of healing by Christian Scientists would come within the legal definition of medical practice, the statute specifically exempts those who, in the treatment of bodily ills, pursue the tenets of any religion. This decision was awarded in the case of a Christian Scientist practitioner convicted in New York in 1912 and fined $100 for practicing medicine illegally. This conviction was reversed by the Court of Appeals and a new trial ordered. The case was a test action instituted by the New York County Medical Society in 1911. In his opinion, reversing the previous decision, Justice Chase comments in part as follows:

"Practicing medicine, when unaccompanied by acts that are in themselves evil, vicious and criminal, is not a crime at common law, but only becomes illegal when a statute is violated. The Legislature, in enacting the law requiring medical practitioners to be licensed, wrote in an exception which applies to Christian Scientists, and which reads:

" 'This article shall not be construed to affect . . . the practice of religious tenets of any church. . . '

"It was conceded at the trial, according to the decision, that Christian Science is a religion based on the scriptures.

"The purpose of the general statute is to protect citizens and others of the state from being treated in their physical ailments and diseases by persons who have not had adequate or proper training, education or qualifications to treat them.

"The tenets of a church are the beliefs, doctrines and creeds of the church. The exception relates to the tenets of the church as an organized body as distinguished from an individual. It does not relate to, or except, persons practicing in accordance with individual belief.

"It appears from the record that it is a tenet of the Christian Science Church that prayer to God will result in complete cure of particular diseases in a prescribed individual case. Healing would seem to be not only the prominent work of the church and its members, but the one distinctive belief around which the church organization is founded and sustained.

"We think the exception in the statute in this state is broad enough to permit offering prayer for the healing of disease in accordance with the recognized tenets of the Christian Science Church. . .

"A person should not be allowed to assume to practice the tenets of the Christian Science or any church as a shield to cover a business undertaking. When a person claims to be practicing the religious tenets of any church, particularly where compensation is taken therefor, and the practice is apart from a church edifice or the sanctity of the home of the applicant, the question whether such person is within the exception should be left to a jury as a question of fact."

This judicial opinion, written by Justice Chase, was concurred in by all of the five judges sitting with him, except Justice Collin, who dissented. Chief Justice Bartlett, in handing down the decision, added a memorandum in which he said, "I would go farther. I deny the power of the Legislature to make it a crime to treat disease by prayer." The judgment of the primary court was, therefore, reversed and a new trial ordered.

In commenting upon this decision, the Weekly Bulletin of the New York Health Department for October 7 refers to it as one "of grave concern to all who are interested. . . in protecting unsophisticated laymen from unqualified pretenders to the healing art."

"While the medical profession is engaged in increasing the requirements demanded of all who wish to begin the study of medicine, and in raising the standards of medical colleges and the exaction of qualifying examinations, in order to secure better service to the public, there are some among the laity who are unwilling to see the practice of the healing art advance beyond the standards of superstition, where the laying on of hands, the use of amulets, charms, signs and magic phrases are relied upon to destroy the parasites of infectious disease in the sick and to frighten them from the well. Are such as who refuse to recognize that a typhoid infection, a smallpox eruption, or even a broken leg is anything more than a state of mind, to be allowed to pass in this state as qualified under the law to attend the sick?

"May any scamp who wishes to turn healer for 'easy money,' claim immunity from the law by pretending that he has a divine mission to heal, that his practice is part of a religion, which he may easily invent to cloak his purpose?

"Instead of four years at high school, a year or two at a general college and a four-year medical course, followed by an exacting state examination, and perhaps by a year's service in a hospital, may one take thought over night and hang out his shingle in the morning as a Christian Scientist, or as anything said to be a religion?

"If this is to be so, and we are loath to believe it, it will be much harder upon the public, the lambs who will be exposed to the wolves, than upon the shepherd dogs (the qualified physicians) who endeavor faithfully to guard the flock!"

PROGRESS OF POLIOMYELITIS.

During the past week the poliomyelitis epidemic has continued practically unabated in Massachusetts, though declining elsewhere throughout the United States and practically at an end in New York. On October 17 the number of cases in New York City reached a total of 9217 with 2373 deaths. In New York State outside of New York City, there had been, on October 1, 2388 cases. On the same date there had been 3877 cases in New Jersey, 1561 in Pennsylvania, 773 in Connecticut, 718 in Minnesota and 672 in Illinois. It is estimated by the United States Public Health Service that there have been 28,262 cases since July 1 in the United States.

In Massachusetts, on October 21, the number of cases during this month reached a total of 518, making 1533 since January 1. Since October 1, the disease has extended into twenty-two towns of this Commonwealth, where no cases had occurred during the preceding ten months. These newly infected towns are Andover, Athol, Belchertown, Deerfield, Easton, Egremont, Grafton, Halifax, Hatfield, Holbrook, Hopkinton, Longfellow, Manchester, Mashpee, Northboro, Northbridge, Walpole, Wenham, Westwood, Whateley, Wilbraham and Wilmington. The largest number of cases has been 380 in Boston, 94 in Holyoke and 51 in Quincy. There have been 38 cases in Malden.

The New York Health Commission has recently published interesting data of the epidemic in New York City, with the following comment on the social status of the patients and on details of the administrative control of the disease.

"It is interesting to record that up to September 30 a total of 16,267 cases of supposed poliomyelitis were reported to the Department by physicians, nurses, and members of various households. Of these, up to September 30, 8630 were proved to be true cases.

"Attention is called to the close approximation of the case fatality in the Department of Health hospitals and the case fatality in the twenty-seven other hospitals which admitted cases during epidemic, the difference being only six-hundredths of one per cent.

"From August 21 to October 18 there were discharged from the hospitals of the Department of Health 2053 cases. Of these, 66% showed evidences of paralysis of some degree; 18% showed that paralysis had wholly disappeared; 15% had not shown paralysis at any time in the course of the disease.

"Of 2715 cases, followed up carefully in the homes, it has been found that 1885 have a serious paralysis of one or both lower limbs and are unable to walk; 530 more were partly paralyzed in the lower limbs, although still able to walk; 273 had one or both arms totally paralyzed.

"Judging from the cases already visited by the agents of the relief societies operating under the control of the Committee on After-Care, it is found that between 75 and 80% of the cases with a persistent paralysis will fall in the class of people usually obtaining medical services free through dispensaries or hospitals."

During the past fortnight, further reports of discoveries regarding the disease have appeared in the daily press. Dr. Edward C. Rosenow, of the Mayo Foundation at Rochester, Minn., is reported to have expressed at a recent meeting of the New York Academy of Medicine his opinion that the tonsil is probably an important point of entry for the infection. Experiments in the pathological department of the Johns Hopkins Hospital in Baltimore, by Dr. Montrose T. Burrows, would seem to indicate that the disease may make its entrance by the intestinal tract through the medium of infected food. No final decision on any of these theories can, of course, be made without further official report and study. At the dinner of the Massachusetts General Hospital House Pupils' Alumni Association, referred to in a later editorial in this issue, Dr. Haven Emerson, health commissioner of New York, in his informal remarks, indicated his belief that none of the present theories advanced to account for the transmission of poliomyelitis would prove, or expresses, the entire truth. He narrated various significant epidemiologic facts observed during the current summer in New York with regard to the disease and expressed the belief that no single therapeutic method had proved of as great value as the simple withdrawal of cerebrospinal fluid by lumbar puncture. This diagnostic procedure has proved, not merely to relieve symptoms, but apparently definitely to mitigate the course of the disease. An extensive report based upon the experience of the entire epidemic will, of course, later be issued.

As leading article in the present issue of the Journal we are glad to publish the text of the address recently delivered by Dr. Allan J. McLaughlin, Massachusetts Commissioner of Health, at a joint meeting of the Massachusetts

Homeopathic Medical Society and the Suffolk District of the Massachusetts Medical Society. Dr. McLaughlin expresses similar skepticism about all advanced theories of transmission of the disease. The attention of readers is particularly directed to his illuminating and comprehensive description of epidemic poliomyelitis and his analysis of the present epidemic in Massachusetts.

On October 19 the Massachusetts Association of Boards of Health held its quarterly meeting on Mt. Tom at Holyoke, Mass. The principal address was by Dr. Charles F. Bolduan, director of the Bureau of Public Education of the New York Health Department, on "What Has Been Learned from the New York Epidemic of Anterior Poliomyelitis." There were other addresses by Dr. Gardner T. Swarts of Providence, R. I., secretary of the Rhode Island State Board of Health, on "Quarantine Hysteria," and by Dr. J. F. Winchester of Lawrence, Mass., president of the American Veterinary Association, on "The Tuberculous Milch Cow."

In the issue of the JOURNAL for September 14 we noted editorially the first death of a physician from poliomyelitis during the present epidemic,—that of Dr. Earl C. Peck of Newton, Mass., on September 5. The second death of a physician from the disease was that of Dr. Arthur L. Hunt, health inspector of the District of Columbia, who died of poliomyelitis on October 8. His obituary notice is published in another column of this issue of the JOURNAL.

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THE STERILIZATION OF CRIMINALS.

A REPORT appearing in the September number of the *Journal of Criminal Law and Criminology* reminds us that the question of the right of the Commonwealth to deprive one of its citizens of the power to procreate is still unsettled, although the general legal opinion is that, in the case of the criminal at least, it has no such right. Recent years have seen a movement in favor of the more humane treatment of prisoners, a scientific approach to the study of criminology, but our knowledge of the etiology of crime is still in too nebulous a state to render wise legislative approval of sterilization of criminals in order that more criminals may not be bred.

If we are going to deprive of his power of procreation, say some, those who have been twice convicted of acts which constitute legal felonies —breaking an electric light bulb, obstructing a highway or cutting a strap in a harness (Iowa code)—we might just as well write above the doors of our penal institutions: *Lasciate ogni speranza, voi ch' entrate.*

The first sterilization law was passed in Indiana in the spring of 1907. Since that time twelve other states have passed such laws, but in two of them (Iowa and New Jersey) they have been found unconstitutional. In four other states bills have been passed and vetoed. In seven other states bills were introduced and defeated in the legislature. It would take entirely too much space to give the history of these measures in the various states. Suffice it to say that so much doubt has arisen as to the constitutionality of such a law as applied to criminals that it is nowhere enforced, with the exception noted above. A test case was brought in Iowa in 1914 (Davis *vs.* Barry *et al.*, No. 9-A Equity.) In his opinion, which was concurred in by the other judges then sitting, Judge MacPherson said: "(This) operation is to destroy the power of procreation. It is, of course, to follow the man through the rest of his life. The physical suffering may not be so great, but that is not the only test of cruel punishment; the humiliation, the degradation, the mental suffering, are always present and known by all the public, and will follow him wherever he may go. This belongs to the Dark Ages. . . And our conclusion is that the infliction of this penalty is in violation of the constitution, which provides that cruel and unusual punishment shall not be inflicted."

It is the opinion of those best informed in the matter that the question of sterilization was entered into rather too hurriedly, before in fact it was definitely known just what part heredity played in the propagation of criminals. An example of this tendency to rush in was furnished by the American Medico-Psychological Association, at its annual meeting in Baltimore in 1914, when it nearly gave the seal of its official approval to a resolution approving of marriage laws—indeed, would have done so had not an objection been registered by a few of the wiser heads.

At present the following states have laws dealing with the sterilization of undesirables: California, Connecticut, Indiana, Iowa, Kansas, Michigan, Nebraska, Nevada, New Jersey, New York, North Dakota, Washington and Wisconsin. In Washington, Nevada,* New Jersey, New York, Michigan and Kansas† no operations have been performed. In Indiana, the first state to pass laws of this kind, no operations have been performed since 1908. Wisconsin has sterilized 24 feeble-minded, Connecticut 21 insane, and California 634 insane. The American Institute of Criminal Law and Criminology appointed a committee on the sterilization of criminals in 1914, which has made several reports on the subject. In their latest one‡ it reports that, as far as it has been able to ascertain, no attempt is being made to enforce any of the laws providing for the sterilization of criminals except in Washington, where the law is punitive. It further states that the law is carefully administered in the states where operations are being performed.

One aspect of the question which has not seemed to attract so much attention is that of the attitude of the sterilized criminal to society. Aside from the fact that he may cherish a deep-seated grudge against the powers that be, may he not be potent for evil in other ways? Let us assume that vasectomy is all that is claimed for it, that it will prevent procreation but will not interfere with sexual intercourse; will not the knowledge that he is immune from the possibility of having to assume the responsibility of paternity render him a dangerous influence in the community? Too often the fear motive is dominant in the lower-class girl, and does more to restrain her from sexual immorality than any ethical consideration. This fear, too, is not that of contracting disease—for she is often unacquainted with the method of transmission of venereal disease, and if she is informed is too ready to believe that her lover is not infected—but the fear of becoming pregnant. The discharged criminal thus finds the bars down and becomes an influence for the lowering of morals in his circle, and often a distributing center for disease.

THE MENTAL EXAMINATION OF CRIMINALS.

It is generally known among medical men that a large proportion of the floating population of jails and workhouses are mentally defective. The vagabonds, prostitutes, the chronic alcoholics, the petty criminals of all kinds, if carefully put through mental examinations, would undoubtedly show many cases of aborted precox, imbecility, constitutional inferiority and constitutional psychopathy. Some observers believe that as many as 60% of all petty criminals are abnormal mentally.

Although we are still a long way from recognizing a class of persons only partly responsible for their actions, the *demi-fous* as the French call them, we are beginning to deal with the problem of investigating the mentality of those convicted of crime. Dr. Healy's work at the Juvenile Psychopathic Institute in Chicago is well known, and there has recently been established at Sing Sing Prison a department of the Rockefeller Foundation to make psychiatric investigation of the population. Court and police officials in many cities are beginning to appeal to alienists in doubtful cases before taking punitive action. Finally, the literature is becoming filled with material dealing with the subject.

In the *Journal of Criminal Law and Criminology* for September, there are two papers bearing on this subject. Dr. Yerkes, who will be remembered at once in connection with the Yerkes-Bridges-Hardwick tests, makes a few remarks on the mental examination of police court cases. He believes that we are only just beginning to progress in this line, that each human being is a tremendously complex individual problem, and that no psychological norm has yet been established. He says that first of all, these cases must be superficially divided into several classes: 1, normal persons, the victims of circumstances; 2, psychopathic personalities; 3, mental defectives; 4, drug addicts; 5, physical wrecks. Other classes may also present themselves. Obviously, some of these classes are not suitable for psychological observation, Classes 1 and 5 especially. Members of Class 2 should be transferred to asylums and studied there. Yerkes urges that each case should be investigated entirely by a single person, who, besides making a complete mental examination, should go into heredity, the personal history and the social conditions which have formed the environment of the patient. He especially protests against the practice of appointing inadequately trained persons to positions as psychological examiners. "If our police system, courts, and penal institutions are to utilize the methods of psychology at all, it should be through the service of adequately trained professional psychologists.''

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* According to the best information available.

† Case pending before the courts, March, 1915.

‡ Sterilization of Criminals. Report of "Committee F" of the Institute. *Journal of Criminal Law and Criminology*, September, 1916.

In the same periodical Dr. Guy G. Fernald writes on the mental examination of reformatory prisoners; his paper is largely constructive in character. In the Massachusetts Reformatory the inmates are not examined until they have been some time resident, in fact, the psychonosological interview is timed for the latter end of the period of incarceration, when the early feelings of resentment or homesickness or rebellion or braggadocio, as the case may be, have passed. The method of applying uniform tests has been abandoned for several reasons: It was too time-consuming; some tests were not adaptable to all subjects; it did not reveal character defects and personality asymmetries; it was too inelastic and formal, and word of the tests was frequently passed around to such an extent that results were vitiated. The line of demarcation between the normal and subnormal, found by various observers among different criminological groups to fall somewhere between 25 and 89%, is in this Reformatory 58%. Of this subnormal group, Fernald says it is important to separate out those who are incapable of honest self-support without surveillance,—what he calls the "segregation group." These show readiness to falsify and striking egotism.

The constructive part of the examination is the last part, where the patient's intentions for the future are ascertained. He may be required, for example, to write out his own plan of living for the next five years, to make up for his past mistakes. His emotional reaction to this suggestion is illuminating. He is also asked why so many prisoners lead no better lives after release, why the reformatory is a good place to reform in, etc. Some prognosis can thus be formed as to his chances for making good when he leaves the reformatory.

These two writers both recognize the individuality of each problem, and emphasize that delinquents should be examined, not by any cut-and-dried methods, but by an intensive individual psychological study, and when this is grasped fully by criminologists we shall have a more enlightened manner of handling offenders. In too many instances, even where the custom of examining inmates mentally is in vogue, the method in use is the hasty and formal application of some such scheme of tests as the Binet-Simon, often by an assistant or social worker, unskilled in psychology.. Naturally the results obtained are of little practical use.

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THE MOSELEY MEMORIAL.

THE seventieth anniversary of Ether Day was observed at the Massachusetts General Hospital with appropriate ceremonies on October 16, 1916. In the morning there were clinics and demonstrations at the Hospital and in the afternoon the award of diplomas to house officers and the Ether Day address by Dr. Haven Emerson, health commissioner of New York. It is expected that this address will be published in full in a later issue of the JOURNAL.

The anniversary of Ether Day has particular interest this year on account of the formal dedication and opening of the Moseley Memorial Building, the new administrative headquarters of the Hospital. This building, representing a cost of about $250,000, is the gift of Mr. Charles W. Moseley, of Newburyport, Mass., in memory of his cousin, Dr. William O. Moseley, a former house pupil at the Massachusetts General Hospital, who met his death in 1879 while climbing the Matterhorn. At the dinner of the House Pupils' Alumni Association, held in the evening at Hotel Vendôme, a narrative of Dr. Moseley's life was given by Dr. John W. Eliot, his classmate. Dr. Haven Emerson spoke on the work of the New York Health Department during the recent epidemic of poliomyelitis and there were other addresses by Dr. Elbridge G. Cutler, the retiring president; by Dr. Hugh Cabot; and by Dr. William F. Whitney, the newly elected president of the Association for the ensuing year.

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SUFFOLK DISTRICT CENSORS' EXAMINATION.

ATTENTION is called to the notice of examination for admission to the Suffolk District of the Massachusetts Medical Society, which was published in last week's issue of the JOURNAL, and is repeated in the present. The importance from every standpoint of belonging to the official medical organization of the state in which he lives should be obvious, not only to every practitioner, but to every recent graduate in medicine. As an immediate sequel to state licensure, membership in the state medical Society is the ultimate index of approved competence. All qualified regular physicians, who have not already done so, should take the coming examination with a view to permanent membership in the Massachusetts Medical Society.

MEDICAL NOTES.

London Death Rates in August.—Statistics recently published show that the total death rate of London during the month of August, 1916, was only 10.6 per thousand inhabitants living. Among the several districts and boroughs the highest rate was 14.5, in Holborn, a crowded central slum, and the lowest was 7, in Hampstead, an open suburb on the north.

Alvarenga Prize.—The College of Physicians of Philadelphia announces that the next award of the Alvarenga prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about $250, will be made on July 14, 1917, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. They must be typewritten, and if written in a language other than English should be accompanied by an English translation, and must be received by the Secretary of the College on or before May 1, 1917.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper, and within the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

The Alvarenga prize for 1916 was not awarded.

Prevalence of Disease in the United States.—The weekly report of the United States Public Health Service for October 6 states that during the month of August, 1916, there were reported in Arkansas 1117 cases of malaria and 206 of typhoid. In California during the same period there were 161 cases of malaria, 57 of pellagra, and 163 of typhoid.

Two Meetings of Medical Interest.—The twenty-sixth annual session of the New York and New England Association of Railway Surgeons was held in New York City on Wednesday and Thursday of last week, October 18 and 19, under the presidency of Dr. D. H. Lake of Kingston, Penn. There were clinics at the New York City Hospitals. The address in surgery was on "Some Practical Points of the Cancer Problem," by Dr. William S. Bainbridge; and among other papers presented there were symposia on "Anesthesia" and "Bone Surgery." Dr. Fred B. Lund of Boston presented a paper on "The Value of Local Anesthesia in Surgery."

The thirteenth session of the Massachusetts State Conference of Charities is to be held in Lowell, Mass., on October 25, 26 and 27. The principal topics to be considered at the several sessions are "Next Steps in Child Welfare," "Present Needs of Working Children," "Housing and Social Progress," "Organized Charity and Social Progress," and "Aid to Mothers with Dependent Children."

On October 25, a meeting of the Boston Conference on Illegitimacy was held at Tewksbury, Mass., at 3.30 p.m. A cordial invitation to attend this meeting is extended to interested members and guests of the State Conference of Charities, to whom an opportunity was afforded to observe the various activities of the infirmary at Tewksbury.

Possibility of Novocaine Addiction.—In the issue of the Journal for October 5, we commented editorially on the possibility of the establishment of novocaine addiction among those for whom the obtainment of cocaine has become impossible. In this connection our attention has been called to the following passage from the "London Letter" in the *Journal of the American Medical Association* for August 26, 1916, on the subject of substitutes for cocaine in dentistry.

"The accidents arising from the use of cocain by the large number of unqualified persons who practice dentistry has led the Government to restrict the use of this drug. The Government has arranged to make available a sufficient supply of novocaine for use as a local anesthetic, in place of cocain, by practicing dentists, whether registered or unregistered. As the supply is not immediately available in the particular forms usually required for dental purposes, and three or four weeks may elapse before it can be made available in these forms, the Government has granted a temporary permit to all persons engaged, July 28, 1916, in the bona fide practice of dentistry, but not to purchase preparations containing more than 1% of cocain, adapted for use as local anesthetic in connection with dental work, subject to the condition that the preparations are used as local anesthetics in connection with such work and for no other purpose. The permit will remain in force until September 15 next. After that date it will not be legal for unregistered dentists to continue to use cocain preparations. Public notice will be given in good time, stating how and where the novocain preparations can be obtained. The Government calls attention to the fact that eucain is being manufactured on an increasing scale in this country, and it is probable that considerable supplies of this drug also will be available shortly to meet the demand for local anesthetics for dental purposes.''

As a matter of fact, we are informed that since the Harrison law went into effect, there have been instances in which cocaine habitués tried to make use of novocaine, but to their vexation found it to have no stimulating or exhilarating properties.

CHOLERA IN JAPAN.—During the past summer Asiatic cholera has been epidemic in Japan, where a total of about 3000 cases have occurred. Report from Tokyo, on September 12, stated that the disease had recently made its appearance in that city, where there had been about eighty cases with thirty deaths. The weekly report of the United States Public Health Service for September 29, 1916, noted the occurrence of 353 cases of Asiatic cholera at Osaka, and of 262 cases, with 107 deaths, in Nagasaki.

EUROPEAN WAR NOTES.

AMERICAN RED CROSS IN SERBIA.—An insight into gratifying civilian relief activities, which are being directed in Serbia for the American Red Cross by Mr. Edward Stuart and Dr. Edward Ryan, is given by two letters just received at Red Cross headquarters from Mr. Stuart in Belgrade, the captured former Serbian capital, dated August 28 and September 13. Mr. Stuart first went to Europe for the American Red Cross early in 1915 as the head of a supplemental force of skilled American sanitarians and participated in the suppression of the deadly typhus epidemic of that year, while Dr. Ryan piloted into Serbia by way of Greece, some months prior to that, the first detachment of American Red Cross surgeons and nurses which served in Belgrade, caring for both Serbian and Austrian wounded and typhus victims for over a year.

An Associated Press dispatch, as late as October 9, said, owing to the inability of the American Red Cross relief commission to obtain further supplies from Roumania, the work directed by Mr. Stuart probably would be terminated with the exhaustion of the supplies on hand toward the end of November. The number of persons depending on the commission for relief of one kind or another was then given at 36,000. Approximately 3180 tons of food, in addition to 10 carloads of clothing, had been distributed. The American Red Cross by means of relief materials obtained in the United States and Roumania and contributed by the Swiss Government, and aided by Austrian military authorities, had succeeded in tiding the needy Serbians over the lean period of the year while the crops were growing. While starvation conditions had been relieved, there was still an urgent need for clothing, and Mr. Stuart hoped this want would be supplied from the United States.

The first of the two letters from Mr. Stuart, above referred to, was written just after Roumania had declared war upon Austria-Hungary. Roumania has been the source of large stores of relief supplies which Mr. Stuart has been purchasing for the American Red Cross not only for the relief work he is directing in Belgrade, but for Dr. Ryan's party to the south. Prior to the declaration of war, Mr. Stuart had procured across the Roumanian frontier 257.5 carloads of supplies, including eighty carloads of maize shipped from Bechet.

WAR RELIEF FUNDS.—On Oct. 21 the totals of the principal New England relief funds for the European War reached the following amounts:

Secours National Fund	$220,154.92
Belgian Fund	161,327.02
French Wounded Fund	127,627.07
Armenian Fund	71,844.46
French Orphanage Fund	66,984.91
Surgical Dressings Fund	48,810.25
Polish Fund	45,885.83
Italian Fund	26,028.04
Prince of Wales Fund	15,469.67
Permanent Blind Fund	13,379.12
French Phthisis Fund	5,277.00
Russian Refugees Fund	2,609.00

MEXICAN NOTES.

MEDICAL PREPAREDNESS.—In a recent issue of the *Military Surgeon* is published an editorial commenting on the present preparedness of the United States Army Medical Corps as contrasted with its inefficiency at the time of the Spanish-American War, and referring also, in conclusion, to the demonstrated efficiency of the Medical Reserve Corps:

''1898 found the medical department of the Army unprepared; 1916 finds it in a high state of efficiency. The lesson of the Spanish-American War was a bitter one. The Medical Corps has 'chewed over it' ever since and determined that the mistakes (many of them due to ignorance and deficient equipment and personnel) would never be repeated. It has been the 'under dog' whenever promotion, increase of numbers and appropriations by Congress have been concerned. It has maintained an uphill fight with the line, as well as with the public, but it has come into its own.

"Whatever sharp criticisms have been made with regard to the unpreparedness of State and Federal government in connection with the present mobilization, the doctors have not been caught napping. Few in numbers—for the ampler provisions of the Army bill had not been established by law—the corps had foreseen the emergency and provided for it. Our troops at the border are actually safer than they would be at home, surrounded by every protection known to modern science, due to the developments in camp sanitation and preventive medicine since 1898. The earnest, but untrained medical officers of the guard have received at least theoretical instruction during these years, and in camp and garrison they have at their elbows the cream of the Medical Corps as their advisers.

"Hasty and superficial as were necessarily the physical examinations at the armories from which raw recruits were unwisely (as we knew at the time) rushed to the border, they were as far as possible checked up by responsible U. S. A. officers, not influenced by the 'fear or favor' which must naturally hamper those in the guard, especially in passing on their own commanding officers.

"Had the original plan of mobilizing in home camps been adhered to, the result would have been far better, but even with chaotic conditions and feverish haste of the first few days, good work was done in weeding out the unfit, though willing, candidates.

"Complaints about bad food, neglect, suffering on trains, poor hospital accommodations, etc., were bound to come, and much sympathy has been expended on our citizen soldiers, which they generally decry. Of course, the medical department is the scapegoat. The doctors are not to blame. As in 1898, it is the company commanders who are more often at fault, through lack of experience rather than neglect on their part.

"In the regular army the line and Medical Corps work together for a common end—to maintain the efficiency of the organization. Read Captain Andrews' 'Fundamentals' and the explanation will be clear, even to the layman.

"Every captain is responsible for the health, physical and moral, of his men and cannot shift that responsibility. Before his own ease, comfort, or convenience, these should be paramount. In the army, on the train or transport, in camp, and on the field of battle, they look to him. The doctor is equally interested in maintaining their efficiency and will coöperate, as far as possible, not only in strictly medical matters, but in others not entirely within his own sphere. The wise company commander will heed his advice, not treat it lightly. This was the great lesson of 1898 and should be that of 1916. Incidentally, attention may be called to the fact that the Medical Reserve Corps (inactive) has also made good. Many of its members have been ordered to the border, to home and foreign stations, and have responded promptly and cheerfully like true soldiers. There has been nothing spectacular about their departure. One by one, as their orders came, they have donned the khaki, dropped their work and devoted themselves with single purpose and energy to such duty as was assigned to them, regardless of loss of patients or financial considerations.

BOSTON AND NEW ENGLAND.

The Week's Death Rate in Boston.—During the week ending Oct. 21, 1916, the number of deaths reported was 213, against 179 for the same period last year, with a rate of 15.68, against 12.44 last year. There were 34 deaths under one year of age, against 28 last year; and 65 deaths over 60 years of age, against 54 last year.

The number of cases of principal reportable diseases were: diphtheria, 31; scarlet fever, 14; measles, 3; whooping cough, 11; typhoid fever, 3; tuberculosis, 34.

Included in the above were the following cases of non-residents: diphtheria, 10; scarlet fever, 5; typhoid fever, 4.

Total deaths from these diseases were: diphtheria, 2; measles, 2; typhoid fever, 3; tuberculosis, 16.

Included in the above were the following deaths of non-residents: measles, 2; tuberculosis, 1; typhoid fever, 3.

Brockton (Mass.) Hospital.—The annual report of the Brockton Hospital, Dr. Loring B. Packard, superintendent, states that the total number of ward patients treated during the past year was 1162, an increase of 8% over the previous year. There was an increase in the out-patient department of 17.5%. The maternity service, however, has shown the greatest gain. The capacity of the Hospital is not sufficient to care for its rapidly growing demands, and plans are being made to raise funds sufficient to erect additional buildings for nurses' home and wards.

Brigham Hospital Training School.—The graduating exercises of the school for nursing at the Peter Bent Brigham Hospital, Boston, were held on Thursday evening of last week, October 19. There was a reception following the award of diplomas to 22 nurses.

New England Tuberculosis Conference.—The third annual New England Conference on Tuberculosis was held in New Haven, Conn., on October 12, 13 and 14, with three hundred delegates in attendance. The principal topics of discussion were compulsory health insurance and the various methods of combating tuberculosis. Leading addresses were made by Mr. Bailey B. Burritt and Edward Hochhauser of New York, and Dr. Joseph J. Pratt and Mr. Seymour H. Stone of Boston.

Vermont Medical Society.—The 103d annual meeting of the Vermont Medical Society was held at St. Johnsbury, Vt., on October 12 and 13. The leading address was by Dr. John R. Williams, of Rochester, N. Y. Dr. Clarence H. Beecher of Burlington, Vt., was elected president of the society for the ensuing year.

Hospital Bequest.—The will of the late Sarah C. Winn of Cambridge, Mass., which was recently filed at the Middlesex Probate Court, contains a bequest of $1000 to the Nantucket Cottage Hospital.

Courses for Dental Nurses.—The Forsyth Dental Infirmary has established a course for dental nurses, planned to conform with the dental registration law passed in Massachusetts last year. By this law dental nurses or hygienists are permitted to work in any public institution, but not in private offices. Candidates for entrance to this course must be 18 years of age, and must present certificates of graduation from approved high schools or the equivalent of a four-year high school course. A small tuition fee is charged.

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Massachusetts Medical Society.

ESSEX NORTH DISTRICT MEDICAL SOCIETY.

A quarterly meeting of Essex North District Medical Society was held at Wolfe Tavern, Newburyport, October 11, 1916, with the President, Dr. F. B. Pierce of Haverhill in the chair.

An interesting and classical paper was presented by Dr. Henry Jackson, of Boston, upon "Abdominal Pain." A valuable discussion upon the paper occurred, opened by Dr. C. E. Durant of Haverhill.

Following the scientific section of the program, the question of the injustice of the Workmen's Compensation Act of Massachusetts, toward employee and physician, was considered, and methods for alleviation were discussed.

It was voted that the business of the First Legislative Convention of Massachusetts Physicians, on Sept. 20, 1916, be ratified.

It was voted that the fund raised by the dollar assessment upon members of Essex North, called on Aug. 16, 1916, be devoted to the work of its Committee upon the Workmen's Compensation Act, as specified in its call.

The next meeting of the Society will be held Wednesday, January 3, 1917, at Haverhill, and the reader will be Dr. J. L. Morse, of Boston.

J. Forrest Burnham,
Secretary.

Miscellany.

RÉSUMÉ OF COMMUNICABLE DISEASES FOR SEPTEMBER, 1916.

Infantile paralysis has practically monopolized the attention of the Department during the month of September. The other important facts on the communicable disease reports for the month were the small number of cases of diphtheria and the explosive outbreak of typhoid fever in Lynn.

Prevalence. The number of cases of communicable diseases reported to this Department was somewhat in excess of the figures for September, 1915. This was due largely to the increased prevalence of anterior poliomyelitis. The other common communicable diseases, with the exception of diphtheria, have maintained their usual prevalence in the State.

	Total Cases Reported		
	Sept., 1915	Sept., 1916	Aug., 1916
Cases	2959	3234	3142
Case incidence per 100,000 population	80.2	85.5	83.2

Measles. There has been a still further decline in the number of measles cases reported to this Department. There are no cities or towns in the Commonwealth at the present time which are having an unusual amount of this disease.

	Total Cases Reported		
	Sept., 1915	Sept., 1916	Aug., 1916
Cases	156	175	595
Case incidence per 100,000 population	4.2	4.6	15.7

The following cities and towns have exceeded their measles endemic index for September:

(Endemic index signifies the average for five years of reported cases exclusive of epidemics. This index is applied to each city and town for each month for every communicable disease. The numbers in parenthesis after the names of each city and town indicate the endemic index for that city or town. The numbers without parenthesis indicate the cases reported during the current month.)

Fall River	(6)	15
Lowell	(5)	29
Southampton	(0)	7

Diphtheria. The reduction in the number of reported cases of this disease during September, as compared with the same month of last year, is striking. On account of the fear of infantile paralysis, many of the schools of the Commonwealth are to remain closed. It will be interesting to note whether this has had any real influence upon the number of cases.

	Total Cases Reported		
	Sept., 1915	Sept., 1916	Aug., 1916
Cases	697	470	460
Case incidence per 100,000 population	18.9	12.4	12.2

While there have been no marked outbreaks of this infection, a number of towns have exceeded their endemic index for the month of September:

Cambridge	(14)	29
Natick	(0)	14
Fitchburg	(3)	23
Ludlow	(0)	13
Westfield	(1)	10

Whooping Cough. There have been no striking features about the whooping cough situation during the month of September. The number of cases has increased slightly over those reported last month and has remained about the same as September of last year.

	Total Cases Reported		
	Sept., 1915	Sept., 1916	Aug., 1916
Cases	465	271	387
Case incidence per 100,000 population	12.6	7.2	10.2

The following cities and towns have exceeded their whooping cough endemic index for the month of September:

Fall River	(6)	29
Brockton	(1)	17
Cambridge	(9)	16
Haverhill	(1)	13

Typhoid Fever. There has been an increase in the number of cases of typhoid fever reported to this Department, both as compared with August of this year and September, 1915. This increase has been due largely to the explosive, milk-borne outbreak in Lynn, which will be described under the head of epidemics. However, Fall River has shown an unusual prevalence of typhoid fever and North Adams has reported considerably more than the average number of cases.

	Total Cases Reported		
	Sept., 1915	Sept., 1916	Aug., 1916
Cases	322	373	265
Case incidence per 100,000 population	8.7	9.8	7

The following cities and towns have exceeded their typhoid fever endemic index for the month:

Fall River	(18)	53
Lynn	(9)	88
North Adams	(3)	9

Scarlet Fever. The number of scarlet fever cases reported to this Department shows an increase when compared with last month, and a decrease when compared with the same month of last year. There have been no marked features of the scarlet fever situation.

	Total Cases Reported		
	Sept., 1915	Sept., 1916	Aug., 1916
Cases	299	203	178
Case incidence per 100,000 population	8.1	5.4	4.7

The following cities and towns have exceeded their scarlet fever endemic index for September:

Marion	(0)	5
Norwood	(0)	6

Pulmonary Tuberculosis. There are no interesting facts to report about pulmonary tuberculosis for the month. There were practically the same number of cases reported during the month just closed as the same month of last year.

	Total Cases Reported		
	Sept., 1915	Sept., 1916	Aug., 1916
Cases	610	602	589
Case incidence per 100,000 population	16.5	15.9	16.6

Rare Diseases. Dysentery was reported from Boston (22), Lexington (1), and Haverhill (3).

Dog-bite was reported from Attleboro (1), Brockton (1), Fall River (1), Hull (3), and Lowell (1).

Cerebrospinal Meningitis reported from Boston (7), Lowell (3), Fall River (1), North Adams (1), Greenfield (1), Worcester (1), Everett (1), and Haverhill (1).

Pellagra was reported from Boston (1), Lynn (1) and Worcester (3).

Trachoma was reported from Boston (9), Chelsea (2), Hanson (1), and Lowell (1).

Malaria was reported from Boston (6), Newton (1), North Attleboro (2), Worcester (1), Fall River (1), Everett (1), Dedham (1), Haverhill (1), Cambridge (1), Uxbridge (3) and Chelsea (1).

Tetanus was reported from Nantucket (1) and Worcester (1).

Septic sore throat was reported from Boston (4), Amherst (1) and Taunton (1).

EPIDEMICS.

Anterior Poliomyelitis. Anterior poliomyelitis has continued to be reported from all parts of the State during the month of September. The total number of cases for the month was 626. This makes a total of 1016 cases reported to this Department since the first of January. For the sake of clearness, the special features of the disease will be discussed under individual heads:

Distribution. The distribution of the cases constitutes one of the peculiar features of the epidemic. This applies to the State as a whole, as was stated last month. There is a distinct localization of foci of infection.

Report of Cases. The reports from Adams and North Adams indicate that in this vicinity the infection has exhausted its susceptible period. In Pittsfield there has been a gradual increase in the number of cases reported during the month, with an additional focus of infection in the neighboring town of Dalton. There were no cases reported from the Greenfield-Montague area during September. This is also true of the lower border of the State in the Dudley-Webster area, while Worcester reported only seven cases during the month.

The focus of infection, localized along the Merrimac River, mentioned in last month's summary, has continued to be an important factor of the month's report. There has been some extension of the infection to North Andover, Boxford, Georgetown, Newbury and Southboro. However, at the present time, the two most important foci are Boston and the Connecticut Valley area, with Holyoke as a center. Holyoke has continued to report cases in increasing numbers. This can also be said of Springfield, while Westfield and Northampton have remained quiescent.

The Metropolitan area has become a very active focus of the infection. Boston, which only reported eight cases in July and August, had 172 in September. Many of the surrounding towns have begun to report cases in small numbers, and it appears that the area will become the most important focus of the infection within the State.

Characteristics. Up to the present time the cases of anterior poliomyelitis have continued to affect the usual age group. The majority of the cases are under ten years of age. This characteristic is one of the most constant features of the disease. Any theory that will explain this infection must satisfactorily explain the constancy with which this age group of the population is attacked.

The following is a list of the cases reported from the various cities and towns during the month of September::

Boston	172
Holyoke	59
Springfield	39
Pittsfield	32
Malden	18
Cambridge	14
Newburyport	13
Quincy	12
Somerville	10
Everett	10
Lynn	9
Chicopee	8
Amesbury	9
Beverly	8
Medford	9
Revere	8
Worcester	7
North Adams	8
Adams	5
Dalton	5
Haverhill	5
Newton	5
Lowell	5
South Hadley	5
Braintree	5
Dedham	5
Chelsea	5
Auburn	5
Warren	5
West Springfield	4
Brookline	4
Milton	4
Fall River	3
Belmont	3
Winchester	3
Weymouth	3
East Bridgewater	3
Leominster	3
Milford	3
North Attleboro	2
Tisbury	2
Boxford	2
Danvers	2
Hamilton	2
Saugus	2
West Newbury	2
Newbury	2
Ludlow	2
Monson	2
Billerica	2
Melrose	2
Waltham	2
Woburn	2
Brockton	2
Winthrop	2
Blackstone	2
Fitchburg	2
Barnstable	1
Bourne	1
Great Barrington	1
Mount Washington	1
Otis	1
Stockbridge	1
Mansfield	1
Taunton	1
Gloucester	1
Marblehead	1
Middleton	1
Nahant	1
Methuen	1
North Andover	1
Rockport	1
Salem	1
Swampscott	1
Bernardston	1
Conway	1
Greenfield	1
Agawam	1
Palmer	1
Southwick	1
Westfield	1
Hadley	1
Northampton	1
Williamsburg	1
Framingham	1
Hudson	1
Lexington	1
Marlborough	1
North Reading	1
Stoneham	1
Tewksbury	1
Wakefield	1
Watertown	1
Westford	1
Weston	1
Nantucket	1
Dover	1
Foxborough	1
Norwood	1
Plainville	1
Stoughton	1
Wellesley	1
Bridgewater	1
Hull	1
Rockland	1
Lunenburg	1
Princeton	1
Oxford	1
Southbridge	1
Westminster	1
Leicester	1

Mortality. From the incomplete records received by this Department, the anterior poliomyelitis fatality rate for September was higher than for August. There were 626 cases reported with 136 deaths, giving for a fatality rate 21.6, as compared with the fatality rate of 15.2 for August. A more detailed analysis of these rates will be made when the final and complete figures are received from the Secretary of State's office.

Typhoid Fever. Beginning August 28, until the end of September, there were reported from Lynn 114 cases of typhoid fever. This outbreak illustrates very strikingly the extensive character of milk-borne typhoid fever, for the investigation of this epidemic showed that all of the cases were on the road of a single milk dealer.

A careful analysis of the source of this milk dealer's supply was made. Most of the milk was produced upon his own farm. Smaller quantities were purchased regularly from an adjoining farm, while for a short period a temporary supply was secured through a neighboring contractor, to whom it came from New Hampshire. These sources of supply have all been thoroughly investigated and examination of the individuals having to do with the handling of milk secured. While the primary source of the infection of this milk supply has not been definitely proven, the reculturing of the specific individuals is not yet complete.

This milk supply was excluded from the city of Lynn until the dealer installed a modern pasteurizing plant.

A detailed report of this outbreak will be published in the later number of the *Bulletin.*

ARMY SURGEONS AS MILITARY COMMANDERS.

In the issue of the *Paris Médical* of April 1, 1916, quoted in the *British Medical Journal* of September 30, Dr. H. Raymondaud narrates the story of two French surgeons who rose to high military command during the Napoleonic Wars.

“Jean Pierre Joseph Bruyère was born in 1772 and served in the campaign of Italy as a surgeon of the first class. Preferring arms to the doctor's gown, he obtained, through the influence of Larrey, a captain's commission. He was a first-class fighting man and promotion was rapid. As colonel of the 23d Chasseurs he went through the campaigns of 1805 and 1806, being made brigadier-general after the battle of Jena. He was created a baron of the Empire in 1808 and a count in 1811. As a general of division he commanded Masséna's light cavalry in the Russian campaign in 1812. He was a man of impetuous valour, and was wounded at Eylau, Wagram, and Moscow, finally dying after amputation through both thighs at the battle of Bautzen in 1813. The other, Jean Baptiste Rusca, was born in 1759, and served as a medical officer in the army of Italy in 1793. In that campaign he was given a combatant commission, and for his conduct at Loasso he was made a brigadier-general on the field of battle. He was promoted general of division in 1799. He was severely wounded at Lodi, and again at Trebbia. In 1801 he was in command of the island of Elba. In 1814 he was killed on the ramparts of Soissons, being then at the head of a division of the National Guards.”

Paul Triare, in his “Dominique Larrey and the Campaigns of the Revolution and the Empire,” also quoted in the same issue of the *British Medical Journal*, recounts the adventures of Colonel Lawless of the Scottish Legion:

“a learned physician who had been professor of physiology in the University of Dublin. His taste for soldiering and his hatred of England led him to take service as a combatant under Napoleon. He was wounded at Kulm in 1813, and Larrey amputated his leg below the knee. Lawless, who as a doctor knew the dangers of the hospitals of that time, mounted his horse immediately after the operation and rode straight to Mayence, here the first dressing was taken off. Thence he made his way to France, arriving there in good condition without any fresh dressing. Marbot in his *Mémoires* mentions Captain Fournier, adjutant-major to General Morland, commander of the *chasseurs à cheval* of the Imperial Guard. He had entered the army as a surgeon, but through Morland's influence obtained a combatant commission, and was killed with his chief at Austerlitz.”

In our own country, the career of General Leonard Wood may be pointed out as a distinguished example of an army surgeon attaining to high military command.

APPOINTMENTS.

Boston Dispensary.—*Dr. Maynard Ladd* has just been appointed Physician-in-chief of the Children's Department of the Hospital for Children of the Boston Dispensary, succeeding *Dr. Arthur A. Howard.* This appointment is made by the Dispensary, on the nomination of the Harvard Medical School. Dr. Ladd is instructor in pediatrics in the Harvard Medical School, is consultant physician of the Children's Hospital, the Floating Hospital and of the Boston Nursery for Blind Babies; a member of the American Medical Association, the American Pediatric Association, the Massachusetts Medical Society, etc. The Boston Dispensary Hospital for Children, the children's out-patient clinics, and the children's preventive clinic will be under his charge. Teaching in pediatrics to students of the Harvard Medical School will be carried on at the Dispensary under his direction. *Dr. Elmer W. Barron* will continue as Associate Physician of the Department, and will give instruction, as in the past years, to students of the Tufts Medical School.

RECENT DEATHS.

Dr. David Francis Lincoln, a retired Boston physician, hygienist and author, died suddenly, October 17, at his home, 131 Myrtle street. Dr. Lincoln was born in Boston, January 4, 1841, and was the son of William L. Lincoln. He studied at Harvard, was graduated in the class of '61 (the same class as Drs. H. P. Bowditch and O. W. Holmes), and three years later from the Harvard Medical School. For eighteen months during the Civil War, he was acting assistant surgeon in the United States navy, and thereafter for a long time he devoted his attention to nervous diseases and did more or less lecturing and writing in connection with Hobart College at Geneva, N. Y., after having retired from actual practice. At one time he was secretary of the American Social Science Association and he was a member of the Twentieth Century Club. He was the author of a number of medical works, published from time to time, and was a frequent contributor to medical journals. He never married. His survivors are three brothers, Walter M. Lincoln of the Brookline Savings Bank, William E. Lincoln of the Boston real estate firm of William Lincoln & Son, and Rev. James Otis Lincoln of San Francisco, Cal.

Dr. Lincoln was a Fellow of the Massachusetts Medical Society from 1865 until 1883, when he resigned. He moved to Geneva, N. Y., in 1881.

Dr. Vincenz von Czerny, senior professor of surgery at the University of Heidelberg, has died recently at the age of seventy-four years.

Dr. Albert Fränkel, who died in Berlin on July 6, was born in 1848. He was one of the earliest pupils of von Leyden, and was a nephew of the famous Traube. For many years he was director of the medical section of the Urban Hospital in Berlin, where he was a prominent physician and enjoyed an extensive consultant practice. His chief distinction is due to his discovery of the pneumococcus as the etiologic agent of lobar pneumonia; but in spite of this and of his notable contributions to medical literature on the subject of respiratory diseases, he never received a university appointment. He was a founder and for many years president of the Association for Internal Medicine of Berlin.

Dr. Herbert Marshall Howe, who died on October 1 at Bristol, R. I., was born in Roxbury, Mass., on July 16, 1844. He received the degree of M.D. from the Medical College of the University of Pennsylvania in 1865, and thereafter served for five years as resident physician of the Episcopal Hospital, Philadelphia. He then relinquished the practice of medicine and went into business, in which he made a large fortune. He is survived by his widow, four daughters, and five brothers.

Dr. Adoniram Brown Judson, who died on September 20 in New York City, was born in 1837. He received the degree of A.B. from Brown University and that of M.D. from Harvard. He made a specialty of orthopedic surgery and was president of the American Orthopedic Association in 1891.

Dr. Edward Kirschner, who died recently at Hagerstown, Md., was born in 1839. He was assistant surgeon aboard the battleship *Cumberland* when it was sunk by the *Merrimac* during the Civil War. Subsequently he became a United States Medical Inspector, retiring with the rank of Commander.

Dr. Joseph L. Lockary, of Roxbury, Mass., who died recently at St. Stephens, N. B., was a native of the latter city. He studied medicine at McGill University and at the Harvard Medical School, from which he graduated in 1897. He was a Fellow of the Massachusetts Medical Society. He is survived by one son.

Dr. Wilbur P. Marble, of New York City, who died on August 30, at Kennebunkport, Me., was born in 1863. He was a practitioner of ophthalmology in New York. He is survived by his widow and one son.

Dr. George Whitehouse Ryan, who died at Boston on September 16, was born in this city on July 16, 1871. After attending the United States Naval Academy, he received the degree of M.D. from the Tufts Medical School. After serving as an ensign during the war between Spain and the United States, he resumed the practice of medicine, and for several years served as surgeon-in-chief at the Brockton, (Mass.) Relief Hospital and at the Grace Hospital, Boston.

Dr. Ezra Bradway Sharp, who died on August 23, at Camden, N. J., was born in 1861. He received the degree of M.D. from the University of Maryland in 1888, and since 1897 had practiced his profession in Canada, where he was instructor in diseases of the stomach at the local polyclinic hospital.

Dr. Eugene P. Stone, U. S. N., who died recently at North Sutton, N. H., was a native of Boston. He received the degree of M.D. from the Harvard Medical School in 1886, and subsequently entered the United States Naval Medical Service, where he became surgeon and had served at the Charlestown Navy Yard, at Annapolis and in the Naval Hospital at Manila, P. I. He is survived by his widow and two sons.

Dr. George Brinton Wilson, who died on October 1, at Chelsea, Mass., was born at Kittery, Me., on June 17, 1863. He received the degree of M.D. from the Dartmouth Medical School and subsequently from the University of Pennsylvania, and was appointed to the United States Navy Medical Corps on February 1, 1889. He sought active service in the Spanish-American War and was for several years fleet surgeon of the Asiatic Squadron. On June 1, 1912, he was appointed medical director and commandant of the United States Naval Hospital at Chelsea.

Dr. Stockbridge P. Graves, who died on October 12, at Saco, Me., was born at Topsham, Me., in 1826. He was graduated from the New York Homeopathic Medical College in 1866, and was the oldest homeopathic practitioner in Saco and Biddeford, Me.

Dr. Arthur L. Hunt, who died of anterior poliomyelitis, on October 8, in Washington, D. C., was born at Lewiston, Me., in 1877. He received the degree of A.B. from Bowdoin College, and studied medicine in Washington, D. C. After practicing for a time in that city, he became an inspector for the Health Department of the District of Columbia. In this capacity, he had exercised supervision over cases of poliomyelitis during the recent epidemic. He is survived by his widow.

Dr. William Appleton Meredith, F.R.C.S., who died recently in Massingham, Norfolk, England, was born at Philadelphia in 1847. He obtained his medical education in London and Edinburgh, and subsequently became a naturalized British subject. He specialized in abdominal surgery and was formerly consulting surgeon of the Samaritan Hospital. He retired from active practice several years ago. He is survived by two daughters and one son and by his widow, who was Miss Caroline Green, a niece of Dr. Samuel A. Green of Boston.

Dr. Matthew Woods, who died recently at Philadelphia, was born in Ireland in 1849. After obtaining his preparatory education in that country, he migrated to the United States shortly after the outbreak of the Civil War, and served for over three years in the United States navy. He received his medical degree from the University of Pennsylvania, and subsequently became a practitioner in that city. He was a member of numerous medical and scientific societies and was the author of several monographs on epilepsy. He is survived by his widow.

Dr. James J. O'Brien, who died recently at Somerville, Mass., was born in that city on June 24, 1873. He was graduated from the Harvard Dental School in 1901, and was for several years instructor in extraction and anesthesia. He was a member of the Harvard Odontological Association. He is survived by his widow, one daughter and two sons.

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SOCIETY NOTICES.

Suffolk District Medical Society.—A stated meeting of the Suffolk District Medical Society, in conjunction with the Boston Medical Library, will be held at the Library, on Wednesday, October 25, at 8.15 p.m.

The meeting will be a symposium in consideration of Workmen's Accident and Sickness Insurance in their Relation to the Medical Profession. There will be papers by Dr. F. J. Cotton of Boston, Mr. John P. Mead of Brockton, Dr. W. H. Merrill of Lawrence, and Dr. F. D. Donoghue of Boston.

Norfolk District Medical Society.—A stated meeting of the society will be held at the Norfolk State Hospital, Wrentham, on Tuesday, October 31, at 4 p.m.

Members may go by automobile from Forest Hills Square by Washington street, through Dedham, Norwood and Walpole. Distance, about 20 miles from Forest Hills Square to Wrentham.

Program of Meeting.

William H. Prescott, M.D., "The History of the Norfolk State Hospital."

Irwin H. Neff, M.D., "Alcoholism from a Medical Viewpoint."

Frank H. Carlisle, M.D., "The Drug Treatment of Morphinism."

The Censors will meet on November 9, at 2 p.m., for the examination of candidates.

Bradford Kent, M.D., *Secretary.*

Massachusetts Medical Benevolent Association.—The annual meeting will be held at the Boston Medical Library on Thursday, Oct. 26, 1916, at 5.30 p.m. The Council will meet at the same place on that date at 5.15 p.m.

George B. Shattuck, M.D., *President.*
Robert M. Green, M.D., *Secretary.*

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NOTICES.

Suffolk District Medical Society, Censors' Examination.—The censors of the Suffolk District Medical Society will meet to examine candidates for admission to the Massachusetts Medical Society at the Boston Medical Library, 8 The Fenway, on Thursday, November 9, at 4 p.m.

Candidates, who must be residents of the Suffolk District or non-residents of Massachusetts, should make a personal application, at least three days before the examination, to the Secretary, at 355 Marlborough street, between 4 and 5 o'clock, p.m. (except Saturdays and Sundays), and present their medical diplomas.

David Cheever, *Secretary,*
Suffolk District Medical Society.